TECHNOLOGY DEPT.

First Copy

A National Newspaper for Every Branch of the Industry

Automotive Daily News

CARS · SHOP EQUIPMENT · TRUCKS · AVIATION · PARTS · ACCESSORIES · TIRES

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PUBLIC LIBRARY DETROIT

S. A. E. OPENS PRODUCTION MEETING

4,000 Delegates at Road Congress as Roy D. Chapin Opens 6th Annual Session

Sixty Foreign Countries Represented; Secretary of State Stimson Delivers Address of Welcome

WASHINGTON, Oct. 6.—With 4,000 delegates, including 450 from sixty foreign countries in attendance, the sixth International Road Congress was opened this afternoon at Constitution Hall, the first gathering of its kind to be held in the western hemisphere. Many of the foremost representatives of the American automotive industry were among those present.

Roy D. Chapin, president of the National Automobile Chamber of Commerce and head of the American Organizing Commission appointed by President Hoover to arrange the congress, officially opened the gathering by introducing Secretary of State Stimson, who delivered the address of welcome.

Secretary Stimson said the interchange of discussions, involving the best experiences of the world, will redound to the benefit of all nations represented. He cited the closer relations brought about by motor travel between Canada and the United States and pointed out that in the near future highway development will make possible an ever increasing interchange of visitors with Latin America.

"In our country, motor vehicles now reach out into areas as yet untouched by other forms of transport," Mr. Stimson said. "We have seen the farmer brought into everyday communication with the city, new breadth given to the life of the urban dweller and commerce quickened. Gradually the motor vehicle has given a flexibility and mobility to our transportation systems, bringing all sections into close touch with one another."

Secretary Stimson sounded the keynote of the congress when he assured the delegates that their un-

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FORD COMPANY SEES INCREASE IN SALES

Detroit, Oct. 6.—Retail sales of Ford cars will show an improvement in the final quarter over the third quarter, according to the opinion expressed by officials of the Ford Motor Company today.

September sales of cars and trucks made by the company were

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U. S. L. BATTERY SALES SET UP HIGH RECORD

Niagara Falls, N. Y., Oct. 6.—USL battery sales to dealers during September eclipsed by a substantial margin the best previous month in USL history, despite the fact that cold weather, which always produces a peak in the battery business, has not yet arrived, C. O. Miniger, chairman of the board, said here today. It can normally be expected that the USL Company will break the September record when cold weather arrives, Mr. Miniger also stated.

"While buying on the part of the dealers has been extremely cautious, USL sales up to September 1 this year have compared favorably with 1929 sales for the same period. That the peak September business is needed for immediate dealer sales and not for stock is shown by the fact that a big majority of orders received call for rush shipment.

"USL Battery, Limited, of Toronto, Canada division of USL Battery Corporation, also reports substantial sales increase for 1930. Despite the fact that USL sales in Canada increased 154 per cent. during 1928 and 1929, USL sale during the first nine months of 1930 show a further increase of 14.8 per cent. over the record sales of 1929."

DETROIT PLANTS OPERATING ON CURTAILED SCHEDULES

By CHRIS SINSABAUGH

DETROIT, Oct. 6.—All car manufacturing plants in Detroit are operating with reduced forces. There are one or two factories running on normal time, but the others are working two and one-half, three and four days a week.

This is the report of the Employers' Association, which, however, will not be specific as to any individual plant. From another source it is learned that the Ford company is operating at four days a week, once in a while slipping to three.

It seems impossible to get information as to what any particular factory is doing. No one wants to talk, and you can't accept rumors. Certain it is, though, the Detroit of today is not the Detroit of yesterday as regards automobile construction. No one is downhearted despite these conditions, and all are

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NINTH ANNUAL GATHERING ATTRACTS 600 DELEGATES

Technical Session to Open With J. A. Bohannon in Chair; Economics Up in Afternoon

DETROIT, Oct. 6.—More than 600 delegates will be on hand tomorrow when the ninth annual production meeting of the Society of Automotive Engineers gets under way here it is indicated by the advance arrivals of engineers today. Every train reaching Detroit tonight is bringing more delegates.

James A. Bohannon, president of the Peerless Motor Car Corporation, will be in the chair when the technical discussions start tomorrow, and the first paper to be read will be that of R. L. Templin of the Aluminum Corporation of America, who will tell of new developments in machining aluminum and its alloys. W. H. McCoy of General Motors will also present a paper at the morning session, his topic being "The Future Development of Tungsten Carbide as a Cutting Tool."

The use of tungsten carbide, a substance made by carbonizing incandescent tungsten in methane or hydrocarbon vapor, has been discussed before different engineering societies during the past year. Molded into suitable form and cemented to the end of a cutting tool, it has been one of the revolutionary contributions to metal cutting.

The economics session will be held after luncheon. John Younger, Ohio State University, will preside at this session.

A mathematical analysis of production costs from a study of economic lot sizes will feature the paper, "The Effect of Time on Production Cost," to be delivered by Paul N. Lehoczky, department of industrial engineering, Ohio State University.

O. B. Jones, Detroit School of Applied Science, Inc., will present "The Tool Engineer's Place in Mass Production."

Certain of the papers to be delivered tomorrow are given, in part, in another section of this edition of the Automotive Daily News.

The committees having the affair

(Continued on Page 11)

COMPLETE AUGUST REGISTRATIONS

COMPLETE new passenger car registrations for August, 1930, by makes and states will be found on pages 8 and 9 of this issue. Comparative registrations for August, 1929, will be found on pages 10 and 11 of this issue.

SHARON TO FILL ORDERS OF BLAIR STEEL COMPANY

Youngstown, O., Oct. 6.—Orders for pressed steel parts on the books of the Blair Steel Strip Company of New Castle will be filled by the strip department of the Sharon Steel Hoop Company, according to an agreement between officials of the two companies. The Blair plant was destroyed by fire with $250,000 loss. Principal customers of the company are Detroit automobile manufacturers.

WORK STARTS ON FORD PLANT IN CALIFORNIA

Richmond, Cal., Oct. 6 (UTPS).—Erection of a steel frame for the $3,500,000 Ford assembly plant at Richmonds' inner harbor on San Francisco Bay has begun and in a few weeks more than 2,000 men will be at work, say officials of the Clinton Construction Company, the general contractors.

August Exports Boosted by Gain in Truck, Bus Casings

Special from A. D. N. Washington Bureau

WASHINGTON, Oct. 6.—A large increase in exports of truck and bus casings caused an unexpected upward turn in foreign shipments of United States rubber goods during August, the rubber division of the Department of Commerce announced today.

The continued low price for which the crude product is selling on the London and New York markets has forced prices down much below those of year ago, or even a month ago, it was pointed out.

During the first six months of this year the average export unit value for a truck casing was placed at $23.16. In July it was $21.57, while in August it averaged only $19.23.

"Throughout the present world-wide economic depression," said Harry W. Newman of the Department of Commerce, "with the consequently reduced exports of rubber goods in the aggregate, the trade in heavy-duty casings has shown an optimistic trend.

"In fact, exports for the first eight months of 1930 in this class were greatly in excess of those in the like period of 1929. The use of larger sized casings on trucks and buses instead of solid and cushion tires has been one of the most outstanding changes in the tire trade in recent years.

"The heavy, solid tire is rapidly becoming a thing of the past, while the heavy-duty type is being consumed in increasing quantities and in many countries its use is being encouraged by government decrees.

"Many foreign tire manufacturing

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A.S.M.E. Oil Meeting Opens In Tulsa; 1,000 Present

TULSA, Okla., Oct. 6.—**Surrounded by oil fields machinery valued at thirteen million dollars, the annual convention program at the International Petroleum Exposition and Progress was opened officially this morning at 9.30 o'clock, when approximately one thousand members of the American Society and Mechanical Engineers, petroleum division, asesmbled in the auditorium at the exposition grounds for their first annual meeting.**

William G. Heltzel, chairman of the petroleum division, associated with the Standolind Pipe Line Company at Tulsa, presided, assisted by Dr. H. J. Masson, secretary of the division, and a number of the faculty of New York University, New York city.

The meeting was opened with greetings from the president of the society, Charles Piez. The purpose and scope of the petroleum division was then discussed by Mr. Heltzel. Technical papers were to be presented by the members covering a wide and varied list of subjects coming within the scope of mechanical engineers in the oil industry, including pipe line. Certain members of the society have been appointed to lead the discussion on the papers after presentation.

Reports of committees which have been carrying on research projects

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4,000 Delegates at Sixth International Road Congress

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selfish spirit of international co-operation will form the basic guarantee for the future peace and prosperity of the world.

Mr. Chapin told the delegates that the United States has spent vast sums in highway building during the last fifteen years, crediting President Coolidge with being one of the first chief executives to recognize the need of affiliation with any other nations.

He paid tribute to the leadership of Thomas H. MacDonald, chief of the United States bureau of public roads for carrying forward the program of Federal aid.

"In the early days of road improvement," Mr. Chapin said, "the highway engineer limited his field to road building, whereas today he must know engineering methods of construction and maintenance, must understand economic influences, how the money must be found to finance the roads and how and when it shall be spent after construction.

"As you motor over our highways you will observe cars with license plates from every one of our states. Our system of roads has been made easy and comfortable. This new freedom of travel has brought about a more truly United States."

M. Edmond Chaix, vice-president of the Permanent International Association of Road Congresses, gave the response to Secretary Stimson's address. Mr. Chaix is president of the Touring Club of France.

The actual business of the road congress will get under way tomorrow morning, when the first session meetings will be held. The congress has been divided into two sections, one to discuss the technical phases of road construction, the other the questions of traffic and finance.

Discussions will be in four languages, French, German, Spanish and English, and as speakers are talking their words will be translated by interpreters.

Six new models showing the stages of construction and machinery used in building different types of modern highway surfacings are on display by the United States Bureau of Public Roads.

Two models showing the construction of the Mount Vernon Memorial Highway at two important locations have been moved from the rotunda of the Capitol to the auditorium to form a part of the exhibit.

FORD COMPANY SEES INCREASE IN SALES

(Continued from Page 1)

greater than had been anticipated, it was said, with the total retail deliveries running above 90,000. Production by the company has been at the rate of 3,800 to 5,500 units per day in recent weeks, with current operations being on a three-day week basis. The company has 80,000 men on the pay rolls in its River Rouge plant.

Officials of the company declare that their dealers are still doing a very large business and that it will pick up between now and the end of the current month.

C. C. McCONVILLE, F. W. D. PRODUCTION HEAD, WEDS

Clintonville, Wis., Oct 6.—C. C. McConville, for the past fifteen years production manager of Four Wheel Drive Auto Company here was married September 27 to Miss Alma Gumz, Milwaukee.

HEXCEL
RADIATORS
. . . the result of more than 20 years' specialization.
Merit alone was the reason for their selection by the American Austin.
HEXCEL RADIATOR CO.
Milwaukee, Wis.

PLANTS IN DETROIT CURTAIL SCHEDULES

(Continued from Page 1)

looking to a decided pick-up the first of the year, while there are local dealers who predict a fair business during the remaining months of the year.

More than any other city, apparently, Detroit is suffering from unemployment. Mayor Murphy realizes this, and he is doing everything in his power to remedy matters. He has brought together all the leading automobile manufacturers and asked for their co-operation. What makes me think he is getting somewhere on this is the fact that, following the meeting at the Detroit Athletic Club last Tuesday, no flambuoyant statements on "what we are going to do" have been made. Each automobile manufacturer said his say to the mayor, and it is certain that good will come out of the meeting.

The Board of Commerce cannot estimate the number of unemployed at the present time, except to point out that the United States census of last April showed 78,000 and it is thought that this has been greatly increased since then. On the bright side, it is estimated that there are at least half a million Detroiters gainfully employed.

In the face of the September registrations from Wayne county, Mich., which is regarded as a sort of national barometer, I feel the month just ended wasn't so bad, all things considered. Wayne county tagged 3,231 new cars as against 3,209 in August, which was 53 per cent. back of September, 1929.

As a crumb of comfort, though, we have the unofficial statement that September production, in a percentage way at least, compares favorably with the September of last year—it's a bit better, in fact, still speaking in percentage terms. It is estimated that this September will be down close to 200,000 as against 232,838 in August, a slip of between 10 and 12 per cent., whereas the difference between the same two months last year shows September losing nearly 17 per cent. over August, the former having produced 572,842 and the latter 429,729.

The past week has been lively in a news way, featured perhaps by the price reductions announced by the Chrysler Corporation—$50 a model on the Chrysler sizes and $100 a model on both Dodge sixes and eights. No explanation is given for the cuts.

R. W. Judson's retirement as chairman of the board of Continental Motors surprised some, but the company points out that Mr. Judson has disposed of substantially all of his Continental holdings and has been inactive in company affairs for several months. It is doubtful if a successor to Mr. Judson as board chairman will be named, the conduct of the business being in the competent hands of President W. R. Angell.

It is said that the Pittsburgh Glass Company paid $300,000 for the site at Marysville, Mich., where it will erect a $20,000,000 plant for the manufacture of shatterproof glass. Putting that much into a new plant is taken as an indication that the company believes the time is not far distant when every car will use shatterproof plate glass, a safety measure that is meeting with commendation on all sides.

CAPT. JOHN A. NELSON GETS DETROIT ASSIGNMENT

Detroit, Oct. 6.—Capt. John A. Nelson has been sent to Detroit to assume the duties as executive officer of the Quartermaster Corps, United States Army, Detroit General depot. This is one of the most important units in the organized reserve, as it is charged with the duty of procuring automotive supplies and accessories for the army in time of emergency. This unit is also responsible for the maintenance of lists of procurement sources and available supplies in the important part of the automotive industry of America.

TRUCK AND BUS CASINGS EXPORTS UP IN AUGUST

(Continued from Page 1)

plants lacked the necessary equipment to produce the large casings for trucks and buses, and when the change came in tire consumption these plants were wholly unprepared to produce the larger sized pneumatics. This places the United States in a peculiar advantage, and at present the American manufacturers and exporters receive only slight competition from the other countries."

Total exports of automotive rubber goods in August amounted to $2,956,410, as compared with $2,599,233 in the previous month. Shipments of truck casings increased from 36,249, valued at $781,909, in July, to 55,817, valued at $1,073,373, in August.

Shipments of automobile casings in August totaled 159,686, valued at $1,389,325, as compared with 158,640, valued at $1,362,469, in July. Shipments of tubes, solid tires and tire repair materials made up the balance of the August total.

On account of its large purchases of heavy duty tires, Japan is one of the United States' best markets for tires. During August Japan took 6,315 truck casings, a number in excess of its purchases of the small sized casings. Spain took 4,777 truck casings, the United Kingdom 1,133, Sweden 1,092 and Germany 1,068, all of these countries having their own local tire industry.

A. S. M. E. OPENS TULSA OIL MEETING

(Continued from Page 1)

since the previous meeting of the society will report progress and achievement. The program for today was as follows: Opening session, greetings from President Piez; "Purpose and Scope of Petroleum Division," by William G. Heltzel; "Service Test on Carbon Formation in Diesel Engine," by E. H. Hillman, lubrication department, technical division, Standard Oil Company of Indiana; discussed by J. B. Harshman; "Lubrication of Power Cylinder and Diesel Engines and Causes of Cylinder Wear," by J. M. McGregor, and J. B. Harshman, Standolind Pipe Line Company, Tulsa, Okla. Discussed by A. N. Horne, Empire Pipe Line Company; Fred Thilenius, Prescott Company; A. E. Flowers, Delavel Separator Company.

"Some Operating Data for Electrical Motor Driven Reciprocating and Centrifugal Oil Pipe Line Pumps," by W. H. Stueve, Oklahoma Gas and Electric Company, Oklahoma City, Okla. Discussed by A. N. Horne.

A. J. Kerr, chairman, Mid-Continent section, A. S. M. E., presided at the sessions this afternoon.

"Economic Design of Oil Pipe Line Transportation System," was the title of a paper by Oscar Wolf, assistant chief engineer the Texas Pipe Line Company, Houston, Tex. William G. Heltzel and F. E. Warterfield, Oklahoma Pipe Line Company, Muskogee, led the discussions.

"Economies of Pumping Oil at Low Section Losses" was presented by Fritz C. Karge, engineer Union Oil Company of California. Discussed by R. S. Danforth, Pacific Coast manager, Kinney Manufacturing Company, and W. H. Stueve, Oklahoma Gas and Electrical Company, Oklahoma City.

The report of committee on economics covered an analysis of pipe line pumping station costs.

The report of committee on fixed and operating charges for Diesel engine pipe line pump stations was read by F. E. Warterfield, Oklahoma Pipe Line Company, Muskogee.

AMERICAN RUBBER LETS CONTRACT FOR $150,000

Salinas, Cal., Oct. 6 (UTPS).—The American Rubber Producers, Inc., Alisal Road, Salinas, has let a contract for a group of rubber manufacturing buildings at Salinas at a cost of some $150,000. The main building will be one story, concrete, wood frame and corrugated iron, 102 by 100 feet.

SPARKS from DETROIT

* * *

"Chevrolet Chronicles"

* * *

New Names; New Signs

* * *

Employed and Unemployed

* * *

Chris Sinsabaugh—Detroit Editor

"CHEVROLET CHRONICLES" go on the air this week, the beginning of one of the most extensive spot broadcasting campaigns yet attempted. As already announced in The Automotive Daily News, this campaign will go through 117 radio stations in all parts of the country. The "Chronicles," which started Sunday, will follow at seven-day intervals thereafter until the close of the year, each weekly chronicle being the experience of some one war veteran who has been decorated for extraordinary valor in action during the great war.

But what we started out to say was that Chevrolet has selected as its first big shot a Chevrolet dealer from Minneapolis, who has been devoting his best efforts to selling Chevrolets rather than talk about his military experience. So it is up to this column to uncover the military record of this dealer, Capt. Albert P. Baston, late of the Fifth Marines, who wears the Distinguished Service Cross, the Croix de Guerre and the Naval Cross, and who the year before the war captained the Minnesota University football team and won an end berth on the All-American that year.

Capt. Baston was cited for conspicuous heroism in action while a first lieutenant in the Fifth Marines, his official citation reading: Although shot in both legs while leading his platoon through the woods at Hill 42, near Chateau Thierry, France, on June 8, 1918, he refused treatment until after he had assured himself that every man in his platoon was under cover and in good firing position."

* * *

ERNEST COLER of the Winningham agency, who edits the Hudson Triangle, said to be the oldest house organ in the industry, is responsible for the discovery of a new word in the automobile language. Driving down John R Street and passing a junk lot, Coler read the sign "Automortician." Could any word be more descriptive? And had you heard it before?

After Coler told us this we ourselves discovered a new sign on a parking lot near the Fort Shelby Hotel, which is our Detroit home, reading: "Parking, 15 cents; Baby Austins, two for a quarter."

* * *

ANOTHER fiftie was heard the other night at the meeting of the Detroit Automobile Dealers' Association, addressed by Mayor Frank Murphy, who discussed the unemployment problem. The mayor was introduced by one of his oldest friends, Pat O'Dea, who sells Grahams hereabouts and who is noted for his wisecracking. Jokingly and talking on unemployment, O'Dea remarked: "I am not unemployed, but I have nothing to do," whereupon the mayor smiled broadly.

* * *

THIS new mayor of ours, Frank Murphy, is going to get along with automobile folk, that is apparent. First he brought all of the leading car manufacturers, including all the "big shots," into a conference on unemployment, and every one who received an invitation showed up. Then he won the hearts of the retailers with his speech at their big meeting the other night. The new mayor is soft spoken, does not look like a politician or act like one, and impresses you with his great sincerity in his aim to give Detroit an administration that cannot be criticized.

* * *

GEORGE W. MALCOLMSON, for several years president of the Malcolmson Coal Company of Detroit, has become affiliated with the truck division of Dodge Brothers Corporation on vocational sales. Dodge recently made a survey of 436 coal dealers in 321 cities and forty-two states, seeking for ideas of the ideal fuel truck. The contact in this survey was what brought Mr. Malcolmson into the Dodge fold.

Old-timers will trace the connection between the past and present with this appointment. Alex Malcolmson was the coal dealer whose bookkeeper was James Couzens and whose money gave Henry Ford his start. George Malcolmson is his son. In those early Ford days the Dodges built the engines for Ford. Now the son is under the Dodge banner.

MERCHANDISING
ACCESSORIES
EQUIPMENT

WHOLESALE

DISTRIBUTION
SHOP EQUIPMENT
REPLACEMENTS

GASOLINE 'WAR' PROBE IN TEXAS

Dallas Federation Is Planning to Buy on Co-operative Basis

Dallas, Tex., Oct. 6.—A gasoline war, started when independent service station operators determined to sever all relations with local wholesalers as soon as possible, has sent prices plunging to low levels and has attracted the attention of the attorney general, who has threatened a vigorous investigation and criminal prosecution if price fixing is found to exist.

The Dallas Automotive Federation, a body made up of owners and operators of independent service stations, has had a committee investigating prices at which gasoline, lubricating oils and greases might be purchased from outside firms. The offers obtained are said to have been so lucrative that plans are under way to purchase these products on a budget, or blanket basis, totaling approximately 75,000,000 gallons of gas and lubricants per year.

In retaliation, the wholesalers have cut retail prices without corresponding wholesale cuts to the independents, which has been interpreted as an attempt to force the latter to sign exclusive contracts before the entry into Dallas of several other large companies that are now contemplating this more.

Satisfactory arrangements for independents concerning pumps and tanks now furnished by the wholesalers has been promised by the committee.

DAHLGREN PLANNING NEW ACCESSORY SHOP

Jamestown, N. Y., Oct. 6—Harry A. Dahlgren, president of the H. A. Dahlgren Company, wholesale automotive equipment concern, with headquarters at 305 East 2d St., has acquired property at 337-339 Fluvanna Ave., on which it is planned to build a modern one and two-story brick, steel and frame automobile accessory shop. Mr. Dahlgren has acquired some of the former buildings of the Salisbury Axle Company, which will be dismantled and the material used in construction of the new home. The concern also operates a branch at Warren, Pa.

VANCOUVER JOBBER HOLDS CELEBRATION

Vancouver, B. C., Oct. 6.—Mackenzie, White & Dunsmuir, Ltd., wholesale automotive equipment and supply merchants of Vancouver, recently marked the opening of its new branch at New Westminster, B. C., by a dinner given to a representative gathering of 250 automobile dealers, garage men and other clients in the Royal City and the Fraser Valley.

John Dunsmuir, president of the firm, who presided, explained that the new building in Westminster was erected at a cost of more than $25,000, and was a sign of the faith the company held in the future before this district. The new building is constructed in such a way that additional storage can be added as necessary.

CLASSIFIED ADVERTISEMENTS IN THE AUTOMOTIVE DAILY NEWS BRING RESULTS

Editor's Column

AMONG the problems which the ....Department of Commerce is studying and which are perhaps of greatest interest to the independent merchant are those dealing with distribution and marketing. Remarkable changes in merchandising have come about in the last quarter century as a result of mass production. These changes have tended to upset methods of distribution, which were deemed fixed and unalterable. Retail stores have increased rapidly in number, and their nature has become so changed that customers are uncertain whether to look for clothing in a haberdashery, a gasoline station or a drug store. Some manufacturers do their own wholesaling and retailing. Retailers own wholesale establishments and wholesalers own or control retail stores.

In any case, the confusion which now exists does not simplify the problem of efficient business administration. Consumers, who usually have neither the time nor the inclination to study the problem, assume, as a rule, that the lowest prices offered are profitable to the seller and that any high price is excessively profitable. Any situation which contributes to consumer distrust only adds to the difficulties of distributors. It is for this and other reasons that the Department of Commerce is concentrating its attention on the problems which affect our national livelihood so directly. More than 750,000 retailers each have sales less than $25,000 a year, and almost 150,000 manufacturers have a yearly production less than $100,000. In other words, there are in this country nearly a million individual business men whose volume of business seems hardly large enough to provide the facilities for the study of their several problems.

Some observers are already stating that these small businesses are on the way out. The great prominence given in the daily news to reports of mergers of manufacturing concerns and the growth of the chain-store movement has caused many to believe that the days of the small manufacturer and the independent merchant are numbered. After a very careful analysis of the situation the Department of Commerce can find no sufficient basis for this opinion. Many economists, too, have predicted that there will be a steady decrease in the rate of expansion of large business operations, and a final stabilization at a point where both large and small businesses have found their plane of most economical operation.

One of the first difficulties encountered is a very general misunderstanding of the functions performed by various types of distributors. The public fancy seems readily caught by such phrases as "eliminating the middleman" and "buying advantage because of size." Without reflection on either chain-store or wholesaler-retailer operation, calm analysis indicates that these two contentions may be fairly measured to show a new use for the arguments. The chain-store warehouse and delivery equipment which supply the local retail units appear to be identical with the usual wholesale equipment. An office force of buyers, supervisors and clerks is required by chain store and wholesaler alike, except that "chain store supervisor" becomes "salesman" when wholesale operations are studied. The chain store operates a wholesaling business to buy in quantities and warehouses a reserve supply for the retail units. This seems to describe wholesaling generally. Item by item the functions performed by the wholesaler might be compared to destroy the illusion that the middleman may be eliminated. The wholesaler as such may be eliminated, but the job remains.

The wholesaler buys in quantities and warehouses a reserve supply for retailers within a radius of economical distribution. If this function is undertaken in an efficient manner there is no apparent reason to predict the elimination of the wholesaler. If the operating costs of the independent wholesaler and retailer are maintained at a point which eliminate both from competition with other types of distribution, then we must look, not to the functions which are performed, but to the manner of performance. The economies effected by the wholesaler in buying car-lot quantities must be lost through hidden leaks. In like manner the special advantages of the local retailer in knowing his customers and having a personal interest in their needs and their problems must suffer a similar dissipation.

Fortunately, evidence is at hand to point to some of the wasteful practices which dissipate the wholesalers' buying advantage and lessen the return which should come from the retailers' personal contact with his customers.

Recent studies by the Department of Commerce have demonstrated that the profits of wholesalers and retailers are being dissipated through wasteful and unnecessary practices, such as the handling of unprofitable items, the soliciting of unprofitable customers, striving for volume of business without regard to costs, and the use of economic credit practices. By a better knowledge of these conditions as they now exist the present wastes can be pointed out and the situation corrected.

Service Notes

Hartford, Conn., Oct. 6.—Tire business is looking up with the Universal Auto Company, exclusive handler of Firestone tires, according to William J. Langdon, secretary of the company. General Manager Fraser of the General Tire Service Company advised that there was improvement in the situation. The local store of Goodrich Silvertown, Inc., advertised last week that it would publicly destroy all old tires taken in trade, which is in conformance with the national policy recently inaugurated.

Jersey City, N. J., Oct. 6.—The Hallady Service, 122 Sanford Place, Jersey City, has been opened by Henry Youteff of Brooklyn.

Erie, Pa., Oct. 6.—C. L. Blowers, operating the U. S. Garage at 5th and French Streets, has organized the C. L. Blowers Tire Service. A modern tire service plant and accessory shop has been established in connection with the U. S. Garage, handling Falls tires and tubes. Robert Blowers, son of the proprietor, will be associated with his father in the operation of the tire service plant.

Camden, N. J., Oct. 6.—The Scotch Company, Kaighn Avenue and Traffic Circle, automobile service station, has been formed by Frank A. Cabeen, Jr., Devon, Pa.; T. Lea Perot, Jr., Camden, and B. R. Graisch, Philadelphia.

Buffalo, N. Y., Oct. 6.—The Modern Heat Treating and Forging Company has been organized to establish and operate a plant for heat treating and forging automotive equipment. Principals of the new concern are Frank F. Feind, Emil A. Reinhard and Henry A. Bauer.

FIRESTONE SERVICE IN MIAMI BUILDING GOOD WILL IN MANY WAYS

Miami, Fla., Oct. 6 (UTPS).—The Firestone Service Stores, Inc., of Miami is offering to the owners of a fleet of trucks a special service on their tires. A truck has been equipped with an air compressor, and a weekly visit is made with this truck to the various garages. Here tires are tested and filled, lugs tightened and minor repairs or adjustments made. There is no charge for this service. It is understood, however, that when tires are to be purchased the Firestone Service Stores will get the business.

Many fleet owners have availed themselves of this service and appreciate the great saving in time which it affords them.

Another good service the Firestone Service Stores, Inc., is offering is to deliver gas and oil to any fleet, at any time, wherever the trucks may be operating. This is also a time saver to contractors, road builders and others who are operating a number of trucks. To have all the trucks gassed and oiled without loss of time amounts to a considerable reduction in overhead. This service is absolutely free; the only cost is the station charge for gas and oil.

NEW TOLEDO VALVE JOBBERS

Toledo, O., Oct. 6.—The Toledo Steel Products Company announces the appointment as jobbers of several well-known automotive supply houses. Among those recently added are the Gehringer & Harlacher Company, Allentown, Pa.; the Wisconsin Auto Parts Company, Milwaukee, Wis., and the Standard Electrical Company, New Bedford, Mass.

Wholesale Brevities

Indianapolis, Ind., Oct. 6.—The Jumbo Equipment Company has been appointed state distributor for the Ruckstell dual high transmission for Model A Fords, according to James S. Long, head of the equipment firm. The dual high gear set is said to be clash-proof and noiseless in intermediate and high, giving greater power, smoothness and economy in driving.

Syracuse, N. Y., Oct. 6.—The Grimes Brake Engineering Service, 617 Erie Boulevard, East, has been appointed distributor for Warner Lockheed hydraulic brake parts and fluid. Acquisition of the distributorship, according to Charles P. Grimes, president of the concern, gives the establishment one of the most completely stocked brake and equipment stocks in New York state. The firm also handles Bendix and Steeldraulic equipment.

Dallas, Tex., Oct. 6 (UTPS).—A Frank Jackson, manager of the Autoquip Company at Paris, Tex., announces that Bob Welson, for some time in the office, has been made traveling salesman in Oklahoma, with Durant as headquarters.

Indianapolis, Ind., Oct. 6.—Herbert L. Clay, for several years connected with the Stutz Motor Car Company here, has been appointed secretary and treasurer of the Kentucky Petroleum Marketers' Association, according to word received here from Louisville, headquarters of the association.

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TOLEDO, OHIO

WILLYS-OVERLAND, LTD., TORONTO, CANADA

Automotive Daily News

"Of, By and For the Entire Automotive Industry"

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Member A. B. C.

TUESDAY, OCTOBER 7, 1930

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Moving Forward

IN his new book, just published by Doubleday Doran and written in collaboration with Samuel Crowther, Henry Ford has some rather startling predictions to make regarding the future development of American industry.

Perhaps the most astonishing prophecy that Mr. Ford advances is that in 1950 American workmen will be earning a minimum wage of $27 a day, an amount equal to $4 per hour. He bases this prediction on the progress in wage increase that has been made during the past twenty years. In 1910 the average wage in the Ford plants was 25 cents per hour. Today it is $1 an hour. If, argues Mr. Ford, we could increases wages fourfold in the past two decades, we can do better in the coming twenty years, with mass production firmly in the saddle and economic values better understood than they have been in the past.

Mr. Ford emphasizes his belief that it is not the cost of living but the value of production that determines wages. He holds that the cost of living is immaterial unless it is used in relation to the standard of living. "If the standard is high, the cost of living is high," says the manufacturer. "But before either standard or cost goes up wages must go up. The standard of living is fixed by wages. We believe that regulating wages on the cost of living is only a way of putting into effect a kind of slavery."

Again Mr. Ford expresses his firm conviction that the five-day week will become universal, and he hints that even this period of labor, as a necessity for living wages, will be reduced by a readjustment in production which will make the worker the master of his social and economic destiny. While he does not say so directly, one can sense that Mr. Ford can see the time when the worker can care for his family as a result of three to four days' work out of the seven.

Protesting against any scheme which would ration out to producers a certain amount of the gross business available, regardless of whether they deserve it or not, Mr. Ford holds would be the end of industrial progress in this country. He presents what may be called four commandments, which American business must ever keep in mind:

1. To make an ever increasing large quantity of goods of the best possible quality; to make them in the best and most economical fashion and to force them out on the market.

2. To strive always for higher quality and lower prices as well as lower costs.

3. To raise wages gradually but continuously and never to cut them.

4. To get the goods to the consumer in the most economical manner so that the benefits of low cost production may reach him.

There may be disagreement with Henry Ford in some of his arguments and dissent from many of the predictions that he makes. However, the fact remains that as a most successful manufacturer and business man, who has practiced in many cases what he preaches, his dictums will receive a careful reading and earnest thought.

Diversification

THERE has just come to our attention a dealer in an Eastern territory who has made a success of handling oil burners. By this we mean house heating plants using fuel oil. This man is in a semi-rural community and perhaps his peculiar position may have made success possible.

However, the real point is that this man has found diversification of lines that will tide him over dull periods in automobile sales. His heating plant units sell best when automobile sales are lowest.

There may be an idea in this for other dealers. Many automotive merchants are handling radio, others are handling refrigeration units and still others have taken on lines of motor boats and equipment.

The Effect of Time on Production Cost

By PAUL N. LEHOCZKY

Department of Industrial Engineering, Ohio State University

The following is an extract of a paper presented before the production meeting of the S. A. E. at Detroit, today:

To obtain the lowest cost and to cut costs constitute one of the chief aims of the production man. He has tackled the problem in a variety of ways, the most obvious of these being by the substitution of more economical materials wherever possible. The second most noteworthy method in cutting costs is an indirect one, and involves the factor **Time.**

The aim of this type of analysis is to ascertain what one's costs are in any particular field, what the lowest possible cost is and, what is more important, by what arrangement the lowest cost can be obtained.

Since any analysis, and especially those subject to frequent changes, is elaborate, the easy way out is to develop a general analysis, which gives a general solution and substitute the values of the special case in the general formula.

Economic Lot Sizes

Economic lot sizes is dependent on what is commonly termed inverse relationships, which simply means that which is a favorable condition or arrangement for one of the factors is a very unfavorable one for the others. As we change the arrangement to suit the second factor, we lose some of the advantage in the first, gaining at the same time in the second. One can think of this as a balance which can be brought into equilibrium only if the weights on both sides are equal.

We want to produce a product, and to know approximately how much of it we will need during the year to come. Disregarding seasonality, our capacity is much greater than the amount to be produced, so the question arises: How shall we distribute our production? Shall we produce the whole amount with one set-up, twelve, or an intermediate number? If we produce everything on one set-up, then there will be one set-up charge. On the other hand, we must buy all of our material at one time and, since we sell the product uniformly throughout the year, there will be a considerable waste in interest and storage charges, not to mention the relatively large capital requirement.

The other extreme is to cut down on our capital requirements, on interest and on storage charges, and produce the product as needed every month. This involves twelve set-ups, which is a very unfavorable condition so far as the cost factor is concerned. The question then arises: What sort of an arrangement will give the lowest cost, considering both factors? This is what a suitable economic lot-size formula tells us. We will consider a simple case involving but two opposing factors, and analyze it.

Application of the Formula

Assigning values to the various factors: S indicates the cost of one set-up for the special case $150; I represents the current interest rate, or 6 per cent; N is the number to be made in the given year, which, in our case, is 30,000; C represents the cost per piece, or $3. In a more thorough analysis, the factor C would need to be qualified in reference to raw and to finished cost; but in this example we will assume C as representing finished cost, for the sake of simplicity. The question then is: What will be the lowest cost of producing the piece and what is the production-time arrangement for this low cost?

If the entire quantity is to be produced at once, the cost will be:

Cost (1 set-up) $= S + (N C \times I)$ (1)

The set-up cost, S, is $150, but the interest charge computation

$$(N C \times I)$$

needs explanation. If we were to keep our capital tied up for the entire year a simple multiplication of capital by interest rate would give this factor, but we sell the product uniformly throughout the year, so that some of our capital is released almost immediately after the product is finished, and, as the year goes on, more and more capital will be released, so that, theoretically at least, there will be no capital tied up at the end of the year. Therefore, the interest on the average capital tied up must be taken, which, in our case, is 0.5, and is represented by A, the "averaging factor."

Cost (1 set-up) $= S + (N C \times A \times I)$ (2)

For the special case we have, by substituting values:

Cost (1 set-up) equals:
$\$150 + [(30{,}000 \times 3) \times 0.5 \times 0.06] = \$2{,}850$ (3)

Suppose the set-up is made twice a year. The set-up cost, S, will be doubled, but the interest charges will be cut one-half. First, there will be but one-half the number of pieces in each set-up, thus reducing the capital investment one-half. Second, the interest on this capital is effective only for six months, even if it were all used throughout the six months; but, according to the foregoing reasoning, the averaging factor, A, must be applied to balance gradual sales. Finally, since we are basing our total cost on the yearly basis, we must multiply by 2, because there are two set-ups. So we have:

Cost (2 Lots) (4)
$= 2S + (2 \times 0.5 NC \times 0.5 A \times 0.5 I)$
$= 2S + 0.5 (N C I/2)$

For the special case we have, by substituting values:

(5)

Cost (2 lots) $= (2 \times \$150) +$
$\{2 \times 0.5 \times (30{,}000 \times 3) \times 0.5 \times 0.03\}$
$= \$1{,}650$

If continuing the analysis by the roundabout method, we would find costs for 3, 4, 5, or more set-ups and then choose the lowest cost-combination. The formula avoids this; it gives the low-cost combination immediately, without solving for a large number of cases. To show how this formula is derived, let us substitute the letter **X** for the number of set-ups. Then we have, for any number of lots, from the previous formulas:

(6)

Cost (X lots) $= S X + (N C I/2X)$

Further Development of the Method

Solving this formula and plotting values, using costs as ordinates and set-ups as abscissas, we would obtain the curve in Fig. 1. The point we wish to find is the low spot, so far as cost is concerned; that is, the lowest cost-arrangement. Since the general equation represents a curve, we can use differential calculus to determine this low spot without any substitution or plotting. Differentiating the equation once will give the slope of the tangents to any point, and the slope of the tangent to the low point is O. Hence, we have:

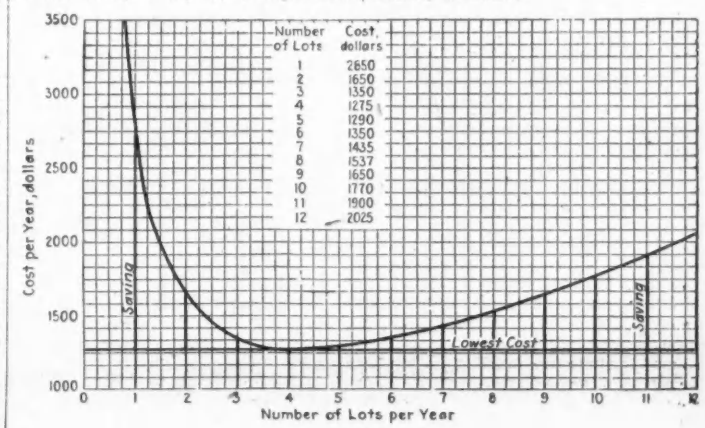


Fig. 1

Cost $= S X + (N C I/2X)$ (7)

Differentiating and equating the tangent to O we have, since

$$X\left\{\frac{dy}{dx}\right\} = 1 \text{ and } 1/X\left\{\frac{dy}{dx}\right\} = \frac{1}{X^2}$$

Then

$O = S - (N C I/2X^2)$ (8)

$X = \{N C I/2S\}^{\frac{1}{2}}$ (12)

Equation (12) indicates that the lowest cost-combination is the one that involves the given number of set-ups, by substituting the values therein. For our specific case:

$$X = \left\{\frac{[30{,}000(N) \times 3(C) \times 0.06.(I)]}{2 \times 150(S)}\right\}^{\frac{1}{2}}$$

$= 4.2$ (13)

(Continued on Page 9)

COMING EVENTS

OCTOBER

2-12—**Paris, France.** Automobile Salon.
6- 7—**Reading, Pa.** Pennsylvania Automotive Association Convention.
6- 8—**Tulsa, Okla.** American Society of Mechanical Engineers Petroleum meeting.
6-11—**Washington, D. C.** Sixth International Road Congress.
6-11—**Washington, D. C.** American Roadbuilders' Association Convention.
7- 8—**Detroit, Mich.** Society of Automotive Engineers production meeting at Book-Cadillac Hotel.
11-26—**Dallas, Tex.** Southwestern Automobile show.
13-15—**French Lick Springs, Ind.** American Society of Mechanical Engineers general meeting.
14-15—**Syracuse, N. Y.** New York State Dealers' Association Convention.
15-17—**Washington, D. C.** Society of Industrial Engineers' convention.
16-25—**London, England.** Olympia Motor Show
20-22—**Atlantic City, N. J.** National Hardware Association convention.
20-24—**Atlantic City, N. J.** Middle Atlantic Automotive Jobbers' Association convention.
22-23—**New York.** Steel Founders' Society of America, Inc., meeting at Hotel Roosevelt.
22-24—**Pittsburgh, Pa.** Society of Automotive Engineers transportation meeting.

NOVEMBER

3- 6—**Chicago, Ill.** National Tire Dealers Association Convention.
7- 8—**Cleveland.** National Battery Manufacturers Association meeting at Hollenden Hotel.
6-16—**Berlin, Germany.** International Automobile Show
8-15—**Chicago, Ill.** Automobile Salon at Drake Hotel
13-19—**Cleveland, O.** Motor and Equipment Association and National Standard Parts Association, Joint Show.
13-23—**Paris, France.** Commercial Vehicle Salon.
14-15—**Los Angeles.** Western Motor Clubs conference.

DECEMBER

6-17—**Brussels, Belgium.** Automobile Exhibition.

JANUARY

3-10—**New York.** National Automobile Show.
8—**New York City.** Society of Automotive Engineers' annual dinner.
10-16—**St. Louis, Mo.** National Roadbuilders' show and convention.
17-24—**Detroit, Mich.** Annual Show, Convention Hall.
17-24—**Baltimore, Md.** Automobile Show.
19-23—**Detroit, Mich.** Society of Automotive Engineers' annual meeting.
24-31—**Chicago, Ill.** National Automobile Show.

The Future Development Of Tungsten Carbide As a Cutting Tool

By W. H. M'COY
General Motors Corp.

The following is an extract of the complete paper to be presented before the production meeting of the S. A. E. in Detroit, today:

In December, 1928 we placed a tool in one of our divisions where they had been experiencing no end of trouble in turning a ferrule. This ferrule was a die-casting, having a hard, chilled surface. The adaption of tungsten-carbide material increased their production from six pieces per grind to as high as 15,000 pieces per grind. Speed was also increased from 750 R. P. M. to 1,400 R. P. M., the latter being the maximum speed attained on this machine. This job was responsible for our becoming interested in this new cutting material, and we have been working with it since that time.

Table I and table II herewith show some results achieved with tungsten-carbide tools in comparison with high-speed and stellite tools.

Although the savings cited above are very impressive, similar savings are not possible on all classes of work because certain shortcomings of this material make it necessary to confine its use to specific materials and conditions. Little success has resulted from use of this material on twist drills. On some automatic screw machine jobs these tools have failed, due to chipping as a result of shock or intermittent cutting.

As cemented tungsten carbide has a high heat conductivity and one which is higher than that of the shank material, when cemented tungsten carbide tools are cutting a material which generates a great amount of heat, two things are apt to happen; first, the shank gets very hot and expands away from the tip, breaking the bond; and, second, there is a tendency to alloy between the chip and the excessively hot cemented tungsten carbide. This latter effect is particularly noticeable when cutting soft steel, and is not so noticeable when cutting steel which is in the Brinell range of 220 to 260. When cutting soft steel it has been noted that a small fin appears on the cutting edge, and that this breaks off and takes with it a small portion of the carbide tip. This action is believed to be caused by the heat generated being sufficient to raise the temperature of the extreme cutting edge to a point when actual alloying takes place between the chip and the carbide cutting edge. The alloy produced is brittle and breaks off, thus causing early failure. The ill effects can be overcome with the present alloys by increasing the size of the tip to permit the heat being conducted away rapidly, so that the alloying temperatures are never attained under ordinary working conditions. It is advisable to remove the machining strains in the tool shanks before mounting the tungsten-carbide tips. These strains should be removed after the machining of the recess is completed by packing the shank in a charcoal pot and heating to approximately 1,750 or 1,800 degress Fahrenheit and allowing it to cool slowly.

It is believed that a large number of grades will be developed for the individual application of this material as a cutting tool.

The low transverse strength of tungsten-carbide tools is responsible for the breaking down of the cutting edge. A realization of this fact is directing the development of cemented tungsten - carbide alloy along two distinct lines:

1. Develpoment of new physical properties to meet certain specific applications by the use of binders other than cobalt.

2. Development of cemented tungsten carbide possessing diverse physical properties by means of the regulation of the size of the carbide particles which are to be bound with the alloy binders.

It has been found that alloying cobalt by the introduction of small quantities of such elements as copper, nickel, tantalum, etc., exerts a most profound effect upon the physical properties of cemented tungsten carbide containing them.

A second series of alloys will undoubtedly also make its appearance with the difference in properties, depending upon the grain size.

The size of the carbide particle to be cemented by the metallic binder is of the utmost importance where fine cutting edges are required. In the early tungsten carbide, the grain size varied. Attempts were then made to make the grains finer and to control the size of these fine particles. Experiments have been conducted which indicate that control of particle size is going to exert a very great effect on the hardness and strength of the finished product. One manufacturer has produced experimentally, cemented tungsten carbide, all of the cemented particles of which are of approximately the same size. This material, although at present being produced experimentally only, has in tests indicated that it possesses strength which is equal to that of fully hardened high-speed steel.

As the result of our findings, we will in the future undoubtedly see many different grades of cemented tungsten carbide. There will be a grade of tungsten carbide developed to suit each particular job, rather than the now common practice of finding the job to suit the tungsten carbide.

In view of past experience and the possibilities of the future, we can see no reason why this material will not replace high-speed steel as a cutting tool in the same proportion that high-speed steel replaced carbon steel.

TABLE I.

Machine	Material	Oper.	S.F. P.M.	Depth of Cut	Pcs. per Grind Tung. Carb.	Pcs. per Grind Tool Steel	Savings per Month
Milling	Aluminum	Fin. Mill	538	0.015	1,013	34	$1,450.00
Lathe	C. I.	Fin. Face	196	0.032	15,000	1,500	200.00
Lathe	No. 32 Bronze	Groove	294	....	4,000	20	576.00
Drill Press	Babbitt	Rough Bore	...	0.093	40,000	400	350.00
New Britain	C. I.	Drill	45	....	16,400	206	140.00
W. & S.	No. 32 Bronze	Bore	157	....	1,064	10	300.00
Lathe	Alloy C. I.	Turn O. D.	98	⅛"	89	5 *	30.96
Bor. Mill	C. I.	Bore Facing	98	⅛"	89	7 *	31.96
Lathe	Alloy	Back of Brake Drum	(Note) *Saving per tool (A saving of 80 hours was accomplished on one set-up.)				

TABLE II.

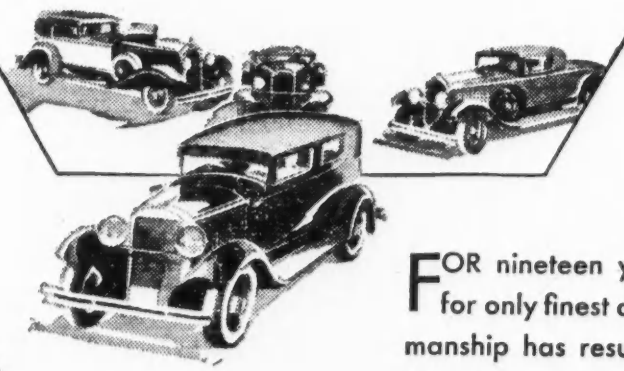
Machine	Material	Operation	Prod. per Day	Cost per 100 pcs. (H. S. Steel)	Cost per 100 pcs. (Tung. Carb.)	Savings per Month
Lathe	Cast Iron	Face Flange	2400	$5.83	$3.14	$1,166.82
Lathe	Cast Iron	Face, Turn & Chamfer	200	15.28	3.36	452.00
Lathe	Cast Iron	Turn, Face & Chamfer	500	24.69	8.37	1,589.60
Lathe	Cast Iron	Face, Turn & Face Hub	...	8.35	*6.50	.....

*Tool has never been sharpened and is still running.

WILLYS-OVERLAND DEALERS HONOR BELL & BOYD CO.

San Francisco, Oct. 6 (UTPS).—With the presence in the city of Perry C. Gartley, general sales manager of Willys-Overland, Inc., of Toledo, O.; G. Verne Orr, vice-president of the Willys-Overland Pacific Company, and J. Lawton of the factory organization, the company's dealers in the northern and central California regions met at a luncheon at the St. Francis Hotel, held in honor of Bell & Boyd, recently appointed Willys-Overland distributor for San Francisco and adjacent territory.

EVERY OTHER CAR BUILT IN 1930 IS AUTO-LITE EQUIPPED!



FOR nineteen years Auto-Lite's reputation for only finest quality of material and workmanship has resulted in the increased use of Auto-Lite starting, lighting, and ignition systems in American automobiles. At present there are more than 8,000,000 automobiles on the roads of America equipped with Auto-Lite electrical systems. This year every other car built will be Auto-Lite equipped—a telling tribute from automobile manufacturers to the dependability of Auto-Lite.

Auto-Lite's reputation has extended to motorists as well as manufacturers. The Auto-Lite equipped car has a ready-made entering wedge into the sales-resistance of the prospective buyer. The Electric Auto-Lite Company. Office and works: Toledo, Ohio. Also makers of DéJon.

Auto-Lite
Starting, Lighting & Ignition

New Dealers Appointed

MISSOURI

Willys-Overland—Tom E. Payne, Green City; J. W. Rose, Inc., Maplewood.

MONTANA

Willys-Overland—Nels W. Norstrom, Custer; J. H. Frisbie, Finch; E. M. Wickstrum, Ryegate; Whitetail Overland Company, Whitetail.

Buick—Jones Motor Company, Lewistown.

NEW HAMPSHIRE

Graham-Paige—Union Street Garage, Peterboro.

NEW YORK

Willys-Overland—C. W. Knight, Beacon; Rockville Center Motor Sales, Rockville Center; A. W. Cook, Gilbertsville; Aldridge & Chase, Bath.

Graham-Paige — Albert Stendts, Canastota.

Marmon-Roosevelt—Fred D. Lanphere, Weedsport.

NORTH CAROLINA

Graham-Paige—M. & H. Garage, Franklin.

NORTH DAKOTA

Buick—Western Motor Company, Inc., Devils Lake.

OHIO

Graham-Paige—The Reitz Kirkwood Company, Lakewood.

SOUTH DAKOTA

Buick—Northwestern Motor Company, Huron; Mitchell Motor Company, Mitchell.

TENNESSEE

Graham-Paige — Hamilton Motor Company, Kingsport; Tillett Sales Company, McMinnville.

VIRGINIA

Willys-Overland—Heplers Garage, Hot Springs.

WISCONSIN

Marmon-Roosevelt — Lake-Land Motors, Inc., Wausau.

WISCONSIN

Graham-Paige—Winberg Motors, Inc., Appleton; Schneider-Mitchell, Stanley.

WYOMING

Buick—Cody Garage, Cody

IN THE ACCESSORY AND SERVICE FIELD

Omaha, Neb., Oct. 6.—A. R. Hollenberger, Omaha automobile top man, has established a complete trimming shop at Schuyler, Neb.

Quincy, Ill., Oct. 6.—The Home Oil Company, operating a chain of thirteen oil stations in this community, will erect a $30,000 superservice station and office building at 5th and Vermont Streets, Dave Brown, president, has announced. The service station will be 25x30 feet, most completely equiped unit of its kind in this city, and the two-story office building, 30x75 feet, will be north of the station, with pits and draining facilities on first floor and offices on the second.

New Brunswick, N. J., Oct. 6.—A certificate of trade name has been filed by Louis Topscher of Avenel Street, Avenel, for the Avenel Auto Body Works.

Nashville, Tenn., Oct. 6.—J. Y. Crawford, long prominent in automobile circles here, has been appointed manager of the Broad Street branch of the Firestone Service Stores.

Chillicothe, Oct. 6 (UTPS).—J. A. Morris of Bedford, Ind., has leased a new building, 50 by 60 feet, on Mill Street, in which he will install a garage, body factory and metal-working shop. The new concern will be opened early in October.

Toledo, O., Oct. 6.—The Logan-gear Products Company will expand its manufacturing facilities here by the installation of addtiional equipment in one of its buildings unoccupied at present. The company manufactures gears, pinions and other automotive parts.

MAJOR SPECIFICATIONS AND MECHANICAL DETAILS

MAKE AND MODEL	Weight—5-P. Sedan	Wheel Base	Engine Make	Fan Belt Type	Thermostat Used	Valve Arrangement	Cylinders	Bore and Stroke	Piston Disp.	Compression Ratio	Tax H. P.	Brake, H. P. and Peak R. P. M.	Pist. Make or Material	No. Main Br.	Oil Purifier	Fuel Clean'r	Carburetor	Air Cleaner
Auburn 6-85	3255	120	Lyc	V	Dole	L	6	2⅞x4¾	185	*5.16	19.8	70@3400	*Alum	4	No	No	Sch	No
Auburn 8-95	3510	125	Lyc	V	Dole	L	8	2⅞x4¾	246	*5.15	26.4	95@3300	*Alum	5	Pur	AC	Sch	No
Auburn 125	3908	130	Lyc	V	Dole	L	8	3¼x4½	299	*5.25	33.8	125@3600	*Alum	5	Pur	AC	Sch	No
Austin	§1130	75	Own	F	——	L	4	2.2x3	45.8	5.1	7.8	13@3000	Alum	2	—	—	Til	—
Blackhawk 6	4320	127½	Own	—	Bish-Bab	O	6	3⅜x4½	241.5	5.10	27.3	85@3150	*Alum	7	Wal	AC	Zen	Un
Blackhawk 8	4185	127½	Own	V	Bish-Bab	L	8	3 x4¾	268.5	5.50	28.8	88@3200	*Alum	5	Wal	AC	Zen	AM
Buick 8-50	3170	114	Own	V	Dole	O	8	2⅞x4¼	220.7	4.8	26.45	77@3200	CI	5	AC	—	Mar	AC
Buick 8-60	3795	118	Own	V	Dole	O	8	3 1/16x4⅝	272.6	4.63	30.02	90@3000	CI	5	AC	—	Mar	AC
Buick 8-80	4255	124	Own	V	Dole	O	8	3 5/16x5	344.8	4.5	35.12	104@2800	CI	5	AC	—	Mar	AC
Buick 8-90	4340	132	Own	V	Dole	O	8	3 5/16x5	344.8	4.5	35.12	104@2800	CI	5	AC	—	Mar	AC
Cadillac 355	——	134	Own	V	Yes	L	8	3⅜x4 3/8	353	5.35	36.45	95@3000	CI	3	—	Gas	Own	—
Cadillac 452	6100	148	Own	V	Yes	O	16	3 x4	452.0	5.50	57.5	165@3400	CI	5	AC	Gas	Own	None
Chevrolet	2500	107	Own	V	Yes	O	6	3 1/16x3¾	194.0	5.01	26.3	46@2600	CI	3	—	AC	Car	AC
Chrysler 6	2745	*169¼	Own	V	Yes	L	6	3⅛x4¼	195.5	5.29	23.44	62@3200	*Alum	4	—	Yes	Car	No
Chrysler 70	3435	*168½	Own	V	Yes	L	6	3⅜x5	268.4	5.00	27.34	93@3200	*Alum	7	Pur	AC	Str	Un
Chrysler 66	2850	*163¼	Own	V	——	L	6	3⅛x4¾	218.6	5.00	23.43	68@3000	Alum	7	Pur	AC	Str	Un
Chrysler 8	——	*186,⅛	Own	V	Yes	L	8	3 x4¼	240.3	5.40	28.8	82@3400	*Alum	5	Yes	—	Str	Yes
Chrysler Imp. 8	——	*211	Own	V	Yes	L	8	3½x5	384.8	5.01	39.2	125@3200	*Alum	9	Yes	—	Str	Yes
Cord (Fr. Wh. D.)	4530	137½	Lyc	V	——	L	8	3¼x4½	298.6	5.25	33.8	125@3600	*Alum	5	Yes	AC	Sch	—
De Soto 6	2705	*169⅛	Own	V	Yes	L	6	3⅛x4⅛	189.81	5.20	23.44	60@3400	*Alum	4	—	Yes	Car	Un
De Soto 8	2965	*177	Own	V	Yes	L	8	2⅞x4	207.7	5.20	26.4	70@3400	*Alum	5	—	Yes	Str	Yes
Dodge Six D D	2668	*168⅝	Own	V	Yes	L	6	3⅛x4⅛	189.8	5.20	23.4	60@3400	*Alum	4	No	No	Car	—
Dodge 8	3043	*176⅞	Own	V	Yes	L	8	2⅞x4¼	220.7	5.20	26.45	75@3400	*Alum	5	Pur	No	Str	Un
Durant 6-14	2950	*172¼-176	Con	V	Bish-Bab	L	6	3¼x4	199	5.32	25.4	58@3100	*Alum	4	AC	AC	Str	AC
Durant 6-17	3290	*175¾-179½	Con	V	Bish-Bab	L	6	3⅜x4⅝	248	5.06	27.34	70@3000	*Alum	7	Ac	AC	Str	AC
Elcar 6-75	2942	117	Lyc	V	Yes	L	6	2⅞x4¾	185	5.25	19.8	61@3000	*Alum	4	Pur	Gas	Sch	—
Elcar 140 and 130	†3980	135-130	Con	V	Yes	L	8	3⅜x4½	322	5.25	36.45	140@3300	*Alum	5	Pur	Gas	Sch	—
Elcar 8-95-96	3299	123	Lyc	V	Yes	L	8	2⅞x4¾	246.7	5.25	26.5	90@3000	*Alum	5	Pur	Gas	Sch	—
Essex	2805	113	Own	V	——	†L	6	2¾x4½	160.4	5.80	18.15	60@3600	Alum	3	—	Ste	Mar	AC
Ford A	2375	103½	Own	V	——	L	4	3⅜x4¼	200.5	4.22	24.03	40@2200	Alum	3	—	—	Zen	—
Franklin 145	3930	125	Own	—	Bish-Bab	*O	6	3½x4¾	274	5.30	29.4	95@3000	Alum	7	AC	AC	Str	AC
Franklin 147	4230	132	Own	—	Bish-Bab	*O	6	3½x4¾	274	5.30	29.4	95@3000	Alum	7	AC	AC	Str	AC
Gardner 136	3330	122	Lyc	V	Dole	L	8	2⅞x4¾	246.6	5.15	26.5	70@3500	*Alum	4	Pur	Gas	Sch	—
Gardner 148	3500	125	Lyc	V	Dole	L	8	2⅞x4¾	246.6	5.15	26.5	100@3300	*Alum	5	Pur	Gas	Sch	AM
Gardner 150	3890	130	Lyc	V	Dole	L	8	3¼x4½	298.6	5.25	33.8	126@3300	*Alum	5	Pur	Gas	Sch	AM
Graham Std. 6	3175	115	Own	F	Dole	L	6	3⅛x4½	207	5.41	23.44	66@3200	*Alum	7	No	AC	DL	AC
Graham Spl. 6	3390	115	Own	F	Dole	L	6	3¼x4½	224	5.49	25.35	76@3400	*Alum	7	AC	AC	DL	AC
Graham Std. 8	3795	122	Own	V	Bish-Bab	L	8	3¼x4½	298	5.20	33.80	100@3400	*Alum	5	AC	AC	DL	AC
Graham Spl. 8	3875	122	Own	V	Bish-Bab	L	8	3¼x4½	298	5.20	33.80	100@3400	*Alum	5	AC	AC	DL	AC
Graham Cust. 8	4300	127	Own	F	Bish-Bab	L	8	3⅜x4½	322	5.41	36.45	120@3200	*Alum	5	AC	AC	John	AC
Graham Cust. 8	4405	137	Own	F	Bish-Bab	L	8	3⅜x4½	322	5.41	36.45	120@3200	*Alum	5	AC	AC	John	AC
Hudson Super 8	3200	119-126	Own	V	——	L	8	2¾x4½	213.8	5.80	24.2	80@3600	Alum	5	—	Ste	Mar	AC
Hupmobile Cen. 6	2900	114	Own	V	Yes	L	6	3¼x4¼	211.6	5.10	25.35	70@3200	Alum	4	Pur	Ste	Str	Yes
Hupmobile Cen. 8	3175	118	Own	V	Pines	L	8	2⅞x4⅝	240.2	5.20	26.45	90@3200	Alum	5	Pur	Ste	Str	Yes
Hupmobile C	3725	121	Own	V	Pines	L	8	3 x4¾	268.6	5.20	28.8	100@3200	CI	5	Pur	Ste	Str	Yes
Hupmobile H & U	**	125-137	Own	V	Pines	L	8	3½x4¾	365.6	5.20	39.2	133@3400	Alum	5	Pur	Ste	Str	AM
Jordan St. Line 80	3490	120	Con	V	Pines	L	8	2⅞x4¾	246.7	5.10	26.5	80@3000	*Alum	5	Ste	AC	Str	AC
Jordan G. Ninety 8	3700	125	Con	V	Pines	L	8	3 x4¾	268.6	5.10	28.9	85@3200	*Alum	5	Ste	Ste	Str	AM
La Salle 345	——	134	Own	V	Yes	L	8	3⅜x4 3/8	353	5.35	36.45	95@3000	CI	3	—	Gas	Own	—
Lincoln	5030	136	Own	V	——	L	8	3½x5	384	4.83	39.2	90@2800	Alum	5	Pur	Own	Str	Un
Marmon-Roosevelt	2833	*172	Own	V	Dole	L	8	2¾x4¼	201.9	5.25	24.2	77@3400	Alum	5	—	—	Str	AC
Marmon Eight 69	3103	*180	Own	V	——	L	8	2 3/8x4¼	211.2	5.50	25.4	84@3400	Alum	5	AC	AC	Sch	AC
Marmon Eight 79	4028	*191	Own	V	Pines	L	8	3 1/16x4⅜	303.2	5.50	32.5	110@3400	Alum	5	AC	AC	Sch	AC
Marmon Big Eight	4363	*202	Own	V	Pines	L	8	3¼x4¾	315.2	5.50	33.8	125@3400	Alum	5	AC	AC	Sch	AC
Nash Single Six	2850	114¼	Own	V	Pines	L	6	3⅛x4⅜	201.3	5.00	23.4	60@2800	*Alum	7	AC	AC	Car	AC
Nash Twin Ig. 6	3535	118-128¼	Own	V	Pines	L	6	3⅜x4½	242	5.00	27.3	74@2800	*Alum	7	AC	AC	Mar	AC
Nash Twin Ig. 8	4000	124-133	Own	V	Pines	L	8	3¼x4½	298.6	5.25	33.8	100@3200	*Alum	9	AC	AC	Mar	AC
Oakland V-8	3205	117	Own	V	Yes	H	8	3 1/16x3⅜	251.0	5.00	37.8	85@3000	S St	3	—	AC	Mar	AC
Oldsmobile	2940	113½	Own	V	——	L	6	3 1/16x4⅛	197.5	5.20	24.4	62@3000	CI	4	AC	AC	John	AC
Packard 826-833	4479	——	Own	V	—	L	8	3 5/16x5	320.0	—	32.5	100@3200	*Alum	9	—	—	Own	—
Packard 840-845	4955	——	Own	V	—	L	8	3½x5	384.8	—	39.2	120@3200	*Alum	9	—	—	Own	—
Peerless St. 8	3642	118	Own	V	Bish-Bab	L	8	2⅞x4¾	246.0	5.00	26.45	85@3200	*Alum	5	Pur	AC	Sch	AC
Peerless Master 8	4521	125	Own	V	Bish-Bab	L	8	3⅜x4½	322	5.00	36.45	115@3200	*Alum	5	Pur	AC	Sch	AC
Peerless Custom 8	4766	138	Own	V	Bish-Bab	L	8	3⅜x4½	322	5.00	36.45	120@3200	*Alum	5	Pur	AC	Sch	AC
Pierce-Arrow	4523	132	Own	V	Yes	L	8	3⅜x4¾	340	5.07	36.45	115@3000	*Alum	9	Yes	Yes	Str	Un
Pierce-Arrow	4304	134	Own	V	Yes	L	8	3½x4¾	366	5.07	39.2	125@3000	*Alum	9	Yes	Yes	Str	Un
Pierce-Arrow	4713	139	Own	V	Yes	L	8	3½x4¾	366	5.07	39.2	125@3000	*Alum	9	Yes	Yes	Str	Un
Pierce-Arrow	4831	144	Own	V	Yes	L	8	3½x5	385	5.07	39.2	132@3000	*Alum	9	Yes	Yes	Str	Un
Plymouth	2595	*167	Own	V	——	L	4	3⅝x4¾	196	4.60	21.03	48@2800	*Alum	3	—	Yes	Car	—
Pontiac	2745	110	Own	V	Var	L	6	3 1/16x3⅞	200.0	4.90	26.3	60@3000	S St	3	—	AC	Mar	Yes
Reo Royale	——	135	Own	V	——	L	8	3 3/8x5	358	—	—	125@3300	Alum	9	Han	AC	Sch	Own
Reo Flying Cloud	——	130	Own	V	——	L	8	3 3/8x5	358	—	—	125@3300	Alum	9	Han	AC	Sch	Own
Reo Flying Cloud	——	125	Own	V	——	L	6	3 3/8x5	268	—	—	80@3200	Alum	7	Nan	AC	Sch	Un
Ruxton Fr.Wh. Dr.	4000	130	Own	V	Yes	L	8	3 x4¾	268.6	5.09	28.8	100@3400	*Alum	5	Yes	AC	Zen	AM
Studebaker Six	2950	114	Own	V	Dole	L	6	3¼x4⅛	205.3	5.20	25.4	70@3200	CI	4	Han	Ste	Sch	—
Studebaker Dict. 8	3155	114	Own	V	Dole	L	8	3 1/16x3¾	221.0	5.10	30.0	81@3200	*Alum	9	Pur	Ste	Str	AM
Studebaker Com. 8	3520	124	Own	V	Dole	L	8	3 1/16x4¼	250.4	5.20	30.0	101@3200	*Alum	9	Han	Ste	Str	AM
Studebak'r Pres. 80	4230	130	Own	V	Dole	L	8	3½x4⅜	337	5.10	39.2	122@3200	*Alum	9	Han	Ste	Str	AM
Studebaker Pres. 90	*4360	136	Own	V	Dole	L	8	3½x4⅜	337	5.10	39.2	122@3200	*Alum	9	Han	—	Str	AM
Stutz	4918	134½-145	Own	—	Yes	O	8	3⅜x4½	322	5.10	36.5	112@3300	*Alum	9	Wal	Gas	Zen	AM
Viking Eight	3620	125	Own	V	Yes	H	8	3⅜x3⅝	259.5	5.10	36.5	81@3200	CI	3	Own	AC	John	AC
Windsor 6-69	3195	120	Con	V	Dole	L	6	2⅞x4¾	185	5.00	19.8	47.5@2600	*Alum	4	AC	—	Str	—
Windsor 6-72	2930	120	Con	V	Dole	L	6	3⅜x4	215	4.94	27.3	66@3200	*Alum	7	AC	—	Str	—
Windsor 6-77	2930	120	Con	V	Dole	L	6	3⅜x4	215	4.94	27.3	66@3200	*Alum	7	AC	—	Str	—
Windsor 8-85	3600	125	Con	V	Dole	L	8	3 x4¾	269	5.00	28.8	85@3100	*Alum	5	AC	Gas	Str	AC
Windsor 8-92	3600	125	Con	V	Dole	L	8	3 x4¾	269	5.00	28.8	85@3100	*Alum	5	AC	Gas	Str	AC
Whippet 96 A	2673	103¼	Own	V	No	L	4	3⅛x4¾	145.7	5.40	15.6	40@3200	CI	3	No	No	Til	No
Willys Six 98-B	2623	110	Own	V	Var	L	6	3¼x3⅞	193	5.56	25.3	65@3400	CI	4	No	Til	Til	Til
Willys 8-80	3076	120	Own	V	Var	L	8	3⅛x4	245.4	5.40	31.25	80@3200	CI	5	No	Til	Til	Til
Willys-Knt. 66-B	3868	120	Own	V	Var	K	6	3⅜x4⅜	255	5.50	27.3	87@3200	*Alum	7	Ski	Til	Til	Til
Willys-Knight 87	3001	112½-115	Own	V	Var	K	6	2 3/8x4⅜	177.9	5.86	20.7	55@3000	*Alum	7	Ski	Til	Til	Til

Weight—*Studebaker 7-pass. sedan †On Elcar 140 4,375 pounds §Austin Standard 2-passenger coupe. **Hupmobile model H weighs 3955 and model U 4225.

Wheel Base—*Over all length of chassis instead of wheel base

Engine Make—Con, Continental; Lyc, Lycoming.

Fan Belt Type—V, V-type; F, flat; C, cone.

Thermostat—Bish-Bab, Bishop & Babcock; Dole, Dole Valve Co., Chicago, Ill.; Pines, Pines Winterfront; Var, various makes

Valve Arrangement—L, L head; H, horizontal; O, overhead; K, sleeve valve. LV, V-type L head. *Air cooled †Thermo syphon water circulation.

Piston Material—*Alum, aluminum with invar struts; Alum, aluminum alloy; CI, cast iron; S St, semi-steel.

Compression Ratio—*Optional on the Auburn.

Oil Purifier—Pur, Purolator; Wal, Wall; Han, Handy; AC, AC Spark Plug Company; Gas, Gascolator; Ste, Stewart-Warner; Til, Tillotson.

Carburetor—Sch, Wheeler Schebler; Zen, Zenith; Mar, Marvet; Car, Carter; Str, Stromberg; DL, Detroit Lubricator; John, Johnson; Til, Tillotson.

Air Cleaner—AC, AC Spark Plug Company; AM, Air Maze; Un, United; Han, Handy; Til, Tillotson.

Front End Drive—Link, Link Belt; Tex, Texolite; Cel, Celeron; Ram, Ramsey; Whit, Whitney Chain; Diam, Diamond Chain; Morse, Morse Chain Company; Var, various makes of chains; Var-G, various makes of gears.

Ignition, Generator and Starter—Aut-L, Auto-Lite; Del-R, Delco-Remy; N E, North East; Dyn, Dyneto. *Bendix starter drive used.

Clutch—Borg, Borg & Beck; Br-L, Brown-Lipe, Rock, Rockford Machine; Russ, Russell Long Long Clutch Company.

Gearset—War, G, Warner Gear Company; Detr, Detroit Gear; Mun, Muncie Gear, WC, Warner Corporation. *Three or four speed gear sets as shown are available for either model.

Universals—Un P, Detroit Universal Products Company; Spic, Spicer Manufacturing Corporation; MM, Mechanics Universal Joint Company, Rockford, Ill.; Cle, Cleveland; Fab, Fabric.

Rear Axle—Col, Columbia; Sal, Salisbury; Cla, Clark Equipment Company; Tim, Timken.

Steering Gear—Gem, Gemmer; Ross, Ross Gear and Tool Company; Sag, Saginaw; Say-B, Saylor-Beall Manufacturing Company, Detroit, Mich.; War, Warner

Brakes—H, hydraulic; M, mechanical; SD, steeldraulic; Bendix, Bendix Brake Corporation. *Bendix front; own rear.

Rear Springs—S, semi-elliptic; El, full elliptic; Cant, semi-cantilever.

Spring Shackles—Tryon, Willys-Morrow Company; Rub B, Rubber Shock Insulator Company; Faf, Fafnir Bearing Company; O-N, O-N Spring Shackle Company; Belf, Belflex Corporation.

Chassis Lubricator—Alem, Alemite; Al-Z, Alemite Zerk; Alem A, Alemite automatic; Bijur, Bijur chassis lubricator; Cen, central magazine; Far, Farval.

Tires—Stutz 134½ wheel base has 33x6.50.

OF PRESENT AMERICAN PASSENGER CAR MODELS

Make and Model	Front End Drive	Ignition System	Gen. and Starter	Clutch	Gear Set and Speeds	Universals	Rear Axle	Ratio	Brakes	Steering Gear	Springs Rear	Spring Shackles	Chassis Lubric.	Tires
Auburn 6-85	Link	Del-R	*Del-R	Long	War 3	Un P	Col ½	*4.9	H	Ross	S 56¾	Own	Bijur	18x5.50
Auburn 8-95	Link	Del-R	*Del-R	Long	War 3	Un P	Col ½	*4.7	H	Ross	S 56¾	Own	Bijur	18x6.00
Auburn 125	Link	Del-R	*Del-R	Long	Detr 3	Un P	Col ½	*4.45	H	Ross	S 56¾	Own	Bijur	18x6.50
Austin	Gear	Aut-L	*Aut-L	Rock	War-G 3	Spic	Sal	5.25	Mech	Say B	Cant	Own	Al-Z	18x3.75
Blackhawk 6	Link	Del-R	Del-R	Borg	Detr 4	Un P	Sal ½	4.75	H	Gem	S 60	Own	Bijur	31x6.00
Blackhawk 8	Link	Del-R	*Del-R	Borg	Detr 4	Un P	Sal ½	4.75	H	Gem	S 60	Own	Bijur	31x6.00
Buick 8-50	Tex	Del-R	Del-R	Own	Own 3	Own	Own ½	4.54	M	Sag	S 54½	Tryon	Al-Z	18x5.25
Buick 8-60	Tex	Del-R	Del-R	Own	Own 3	Own	Own ¾	4.45	M	Sag	S 55¼	Own	Al-Z	19x5.50
Buick 8-80	Tex	Del-R	Del-R	Own	Own 3	Own	Own ¾	4.27	M	Sag	S 58¾	Own	Al-Z	19x6.50
Buick 8-90	Tex	Del-R	Del-R	Own	Own 3	Own	Own ¾	4.27	M	Sag	S 58¾	Own	Al-Z	19x6.50
Cadillac 452	Morse	Del-R	Del-R	Own	Own 3	Spic	Own ¾	4.75	Own-M	Sag	S 58	Own	Alem	19x6.50
Cadillac 355	Morse	Del-R	Del-R	Own	Own 3	Spic	Own ¾	4.39	Own	Own	S 60	Own	Alem	19x7.00
Chevrolet	Var	Del-R	*Del-R	Own	Own 3	Own	Own ½	3.82	M	Own	S 54	Tryon	Alem	19x4.75
Chrysler 6	Morse	Del-R	Del-R	Own	Own 3	Un P	Own ½	4.60	H	War	S 53¾	Tryon	Al-Z	19x5.00
Chrysler 70	Morse	Del-R	Del-R	Own	Own 4	Un P	Own ½	3.82	H	War	S 57¾	Rub B	Al-Z	18x5.50
Chrysler 66	Morse	Del-R	Del-R	Own	Own 3	Un P	Own ½	4.70	H	War	S 54⅝	Rub B	Al-Z	18x5.50
Chrysler 8	Morse	Del-R	Del-R	—	Own 4	—	Own ½	4.10	H	War	S 54⅝	——	Al-Z	18x5.50
Chrysler Imperial 8	Morse	Del-R	Del-R	—	Own 4	—	Own ½	3.81	H	Ross	S 57½	——	Al-Z	18x7.00
Cord (Fr. Wh. Dr.)	Link	Del-R	*Del-R	Long	Det 3	UnP&MM	Col F	4.41	H	Gem	S 62	Own	Bijur	18x7.00
De Soto 6	Var	Del-R	Del-R	Borg	Own 3	Un P	Own ½	4.6	H	Own	S 53¾	—	Al-Z	19x5.00
De Soto 8	Var	Del-R	Del-R	Borg	Own 3	Un P	Own ½	4.6	H	Own	S 54⅝	Rub B	Al-Z	19x5.25
Dodge 6 D D	Morse	Del-R	Del-R	Borg	Own 3	Un P	Own ½	4.9	H	War	S 53¾	Tryon	Al-Z	19x5.00
Dodge 8	Morse	Del-R	Del-R	Borg	Own 3	Un P	Own ½	4.6	H	War	S 54⅝	Rub B	Al-Z	18x5.50
Durant 6-14	Morse	Aut-L	*Aut-L	Borg	Own 3	Spic	Own ½	4.4	S D	Own	S 55	Tryon	Alem	29x5.00
Durant 6-17	Morse	Aut-L	*Aut-L	Borg	Own 4	Spic	Own ½	3.72	S D	Own	S 55	Tryon	Alem	29x5.50
Elcar 6-75	Link	Del-R	*Del-R	Long	War-G 3	Spic	Sal ½	4.88	H	Ross	S 53½	Belf	Alem	29x5.00
Elcar 140 and 130	Link	Del-R	*Del-R	Long	War-G 4	Spic	Sal ½	...	H	Ross	S 57	Belf	Alem	30x7.00
Elcar 8-95-96	Link	Del-R	*Del-R	Long	War-G 3	Spic	Sal ½	4.90	H	Ross	S 56	Belf	Alem	29x5.50
Essex	Morse	Aut-L	*Aut-L	Own	Own 3	Spic	Own ½	5.41	Bendix	Gem	S 54⅝	Own	Alem	19x5.00
Ford A	Cel	Own	*Own	Own	Own 3	Own	Own ¾	3.7	M	Gem	S Tr	Own	Al-Z	19x4.75
Franklin 145	Ram	Del-R	*Del-R	Br-L	*Detr 4	Spic	Own ½	4.54	H	Gem	El 42	None	Al-Z	19x6.50
Franklin 147	Ram	Del-R	*Del-R	Br-L	Detr 4	Spic	Own ½	4.73	H	Gem	El 42	None	Al-Z	19x6.50
Gardner 136	Link	Del-R	*Del-R	Borg	War-G 4	Spic	Col ½	4.45	H	Ross	S 54	O-N	Alem	29x5.50
Gardner 148	Link	Del-R	*Del-R	Borg	Own 4	Spic	Col ½	4.45	H	Ross	S 54	O-N	Alem	29x5.50
Gardner 150	Link	Del-R	*Del-R	Borg	War-G 3	Spic	Col ½	4.45	H	Ross	S 57	O-N	Alem	30x6.50
Graham Std. 6	Link	Del-R	*Del-R	Long	War-G 3	Un P	Sal ½	4.7	H	Ross	S 54	Tryon	AL-Z	19x5.25
Graham Spl. 6	Link	Del-R	*Del-R	Long	War-G 4	Un P	Sal ½	3.91	H	Ross	S 54	Tryon	Al-Z	18x5.50
Graham Std. 8	Link	Del-R	Del-R	Long	W C 3	Un P	Sal ½	4.45	H	Ross	S 56	Rub B	Al-Z	18x6.00
Graham Spl. 8	Link	Del-R	Del-R	Long	War-G 4	Un P	Sal ½	3.90	H	Ross	S 56	Rub B	Al-Z	18x6.00
Graham Cust. 8	Link	Del-R	Del-R	Long	War-G 4	Un P	Cla ½	3.92	H	Ross	S 58	Own	Bijur	19x6.50
Graham Cust. 8	Link	Del-R	Del-R	Long	War-G 4	Un P	Cla ½	3.92	H	Ross	S 58	Own	Bijur	19x6.50
Hudson Super 8	Morse	Aut-L	*Aut-L	Own	Own 3	Spic	Own ½	4.7	Bendix	Gem	S 54⅝	Own	Alem	18x5.50
Hupmobile Cen 6	Morse	Aut-L	*Aut-L	Borg	Detr 3	MM	Sal ½	4.70	S D	Ross	S 53	Tryon	Al-Z	19x5.50
Hupmobile Cen 8	Morse	Aut-L	*Aut-L	Borg	Detr 3	Un P	Sal	4.55	S D	Ross	S 52¾	Rub B	Al-Z	19x5.50
Hupmobile C	Morse	Aut-L	*Aut-L	Long	Detr 3	Un P	Own ½	4.55	S D	Ross	S 54	Own	Alem	31x6.00
Hupmobile H and U	Morse	Aut-L	*Aut-L	Long	Detr 3	Un P	Own ½	4.07	S D	Ross	S 57	Own	Alem	19x6.50
Jordan St. Line 80	Morse	Aut-L	*Aut-L	Long	War-G 3	Cle	Col ½	4.9	H	Gem	S 55¾	O-N	Alem	28x5.50
Jordan Grt. Ninety 8	Morse	Aut-L	*Aut-L	Long	War-G 3	Cle	Col ½	4.25	H	Gem	S 55¾	O-N	Alem	30x6.00
La Salle 345	Morse	Del-R	Del-R	Own	Own 3	Spic	Own ¾	4.75	Own-M	Sag	S 58	Own	Alem	19x6.50
Lincoln	Morse	Del-R	Del-R	Own	Own 3	Spic	Tim F	4.58	Bendix	Own	S 60	Own	Alem	20x7.00
Marmon-Roosevelt	Diam	Del-R	*Del-R	Rock	War-G 3	Spic	Sal ½	4.9	Bendix	Ross	S 54⅛	Tryon	Al-Z	19x5.50
Marmon Eight-69	Diam	Del-R	*Del-R	Rock	War-G 3	Spic	Sal ½	4.9	Bendix	Ross	S 56⅝	Rub B	Al-Z	19x5.50
Marmon Eight-79	Diam	Del-R	*Del-R	Rock	Detr 3	Spic	Sal ½	4.7	Bendix	Ross	S 60	Rub B	Al-Z	19x6.00
Marmon Big 8	Diam	Del-R	*Del-R	Rock	War-G 4	Spic	Sal ½	4.45	Bendix	Ross	S 60	Rub B	Al-Z	19x6.50
Nash Single Six	Cel	Aut-L	*Aut-L	Borg	Own 3	Fab	Own ½	4.7	S D	Ross	S 50⅞	Tryon	Alem A	29x5.00
Nash Twin Ig. 6	Cel	Aut-L	*Aut-L	Borg	Own 3	Own	Own ½	4.5	Bendix	Gem	S 54	Own	Bijur	29x5.50
Nash Twin Ig. 8	Diam	Aut-L	*Aut-L	Borg	Own 3	Own	Own ½	4.5	Bendix	Gem	S 56¾	Own	Bijur	31x6.50
Oakland V-8	Morse	Del-R	Del-R	Own	Own 3	MM	Own	4.42	M	Sag	S 54½	Tryon	Al-Z	28x5.50
Oldsmobile	Var	Del-R	Del-R	Borg	Mun 3	Un P	Own ½	4.54	Own	Sag	S 54½	Tryon	Alem	28x5.25
Packard 826-833	Morse	Dyn	*Dyn	—	Own 4	—	Own ½	——	M	Own	S 60½	——	Bijur	19x6.50
Packard 840-845	Morse	Dyn	*Dyn	—	Own 4	—	Own ½	——	M	Own	S 60½	——	Bijur	19x7.00
Peerless St. 8	Link	Aut-L	*Aut-L	Rock	War-G 3	Spic	Sal ½	4.7	Bendix	Ross	S 56⅝	Rub B	Alem	29x5.50
Peerless Master 8	Link	Aut-L	*Aut-L	Rock	War-G 4	Spic	Sal ½	4.45	Bendix	Ross	S 60	Rub B	Alem	31x6.00
Peerless Custom 8	Link	Aut-L	*Aut-L	Rock	War-G 4	Spic	Sal ½	4.45	Bendix	Ross	S 60	Rub B	Alem	31x6.50
Pierce-Arrow	Morse	Del-R	Del-R	Long	Own 4	Spic	Own ½	4.58	Bendix	Gem	S 60	Faf	Al-Z	19x6.50
Pierce-Arrow	Morse	Del-R	Del-R	Long	Own 4	Spic	Own ½	4.08	Bendix	Gem	S 60	Faf	Al-Z	18x7.00
Pierce-Arrow	Morse	Del-R	Del-R	Long	Own 4	Spic	Own ½	4.42	Bendix	Gem	S 60	Faf	Al-Z	18x7.00
Pierce-Arrow	Morse	Del-R	Del-R	Long	Own 4	Spic	Own ½	4.42	Bendix	Gem	S 60	Faf	Al-Z	18x7.00
Plymouth	Cel	Del-R	Del-R	Rock	Own 3	Own	Own ½	4.37	H	War	S 53⅜	Tryon	Al-Z	19x4.75
Pontiac	Morse	Del-R	Del-R	Own	Own 3	MM	Own	4.42	M	Sag	S 54	Tryon	Al-Z	29x5.00
Reo Royale	Morse	DR	DR	Long	Own 3	Un P	Own	4.07	H	Ross	S 57¼	Own	Far	6.50x18
Reo Flying Cloud	Morse	DR	DR	Long	Own 3	Un P	Own	4.07	H	Ross	S 57¼	Own	Al-Z	6.50x18
Reo Flying Cloud	Morse	DR	DR	Long	Own 3	Un P	Own	4.42	H	Ross	S 55	Own	Al-Z	6.50x18
Roxton (Fr. Wh. Dr.)	Link	Aut-L	*Aut-L	Long	Own 3	Own	Own	4.25	H	Gem	S 55	Own	Alem	31x6.00
Studebaker Six	Whit	Del-R	*Del-R	Long	Own 3	Spic	Own ½	4.73	Bendix	Ross	S 54	Tryon	Alem	19x5.25
Studebaker Dict. 8	Var G	Del-R	*Del-R	Long	War-G 3	Spic	Own ½	5.11	Bendix	Ross	S 54	Tryon	Al-Z	19x5.25
Studebaker Com. 8	Var G	Del-R	*Del-R	Long	Own 3	Spic	Own ½	4.73	Bendix	Ross	S 56	Faf	Al-Z	19x6.00
Studebaker Pres. 80	Var G	Del-R	Del-R	Long	Own 3	Spic	Own ½	4.31	Bendix	Ross	S 60	Faf	Al-Z	19x6.50
Studebaker Pres. 90	Var G	Del-R	Del-R	Long	Own 3	Spic	Own ½	4.31	Bendix	Ross	S 60	Faf	Al-Z	19x6.50
Stutz M	Link	Del-R	Del-R	Borg	Detr 4	MM	Tim ½	4.5	H	Gem	S 62¼	Own	Bijur	32x7.00
Viking Eight	Whit	Del-R	Del-R	Borg	Mun 3	MM	Own ¾	4.63	Bendix	Sag	S 58	Tryon	Alem	30x6.00
Windsor 6-69	Morse	Aut-L	*Aut-L	Borg	War-G 3	MM	Col ½	4.9	H	Ross	S 54	O-N	Alem	29x5.25
Windsor 6-72	Link	Del-R	*Del-R	Borg	War-G 3	MM	Col ½	4.9	H	Ross	S 54	O-N	Alem	29x5.50
Windsor 6-77	Link	Del-R	*Del-R	Borg	War-G 4	MM	Col ½	3.9	H	Ross	S 54	O-N	Alem	29x5.50
Windsor 8-85	Link	Del-R	*Del-R	Borg	War-G 3	MM	Col ½	4.63	H	Ross	S 54	O-N	Alem	31x6.00
Windsor 8-92	Link	Del-R	*Del-R	Borg	War-G 4	MM	Col ½	3.9	H	Ross	S 54	O-N	Alem	31x6.50
Whippet 96 A	Var	Aut-L	Aut-L	Borg	Own 3	MM	Own ½	4.55	Bendix	Own	S 40½	Tryon	Alem	19x4.75
Willys-Six 98 B	Var	Aut-L	Aut-L	Borg	Own 3	MM	Own ½	4.60	Bendix	Own	S 49¾	Tryon	Alem	19x5.00
Willys 8-80	Link	Aut-L	Aut-L	Borg	Own 3	MM	Own ½	4.60	Bendix	Ross	S 56	Tryon	Alem	19x5.50
Willys-Knight 66 B	Link	N E	N E	Rock	Own 3	MM	Own ½	4.60	Bendix	Ross	S 57½	Own	Bijur	19x6.00
Willys-Knight 87	Link	Aut-L	Aut-L	Rock	Own 3	MM	Own ½	4.89	Bendix	Own	S 53	Tryon	Alem	19x5.50

DEALER DOINGS

Hollywood, Cal., Oct. 6.—Douglas M. Longyear, Packard dealer, 7026 Hollywood boulevard, is constructing a $300,000 building at Sunset and Cherokee Streets as his future headquarters. The building will have a frontage on Sunset of 100 feet, and a depth of 250 feet on Cherokee. There will be 35,000 square feet of floor space, 11,000 square feet of which will be used for a showroom.

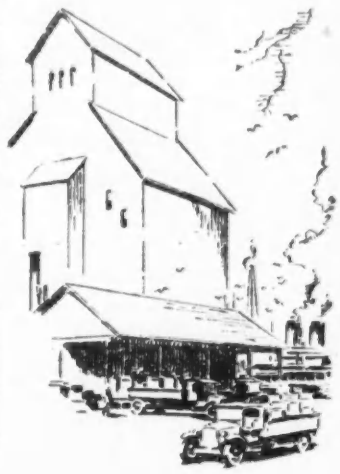
Burlington, Ia., Oct. 6.—T. R. Alcorn, formerly with the Bolick Auto Brokerage Company, has opened a sales and service room for Stutz at 110 North Main St. The firm will operate as the Blackhawk Motor Sales.

Titusville, Fla., Oct. 6.—Titusville Motor Company has just been organized to deal in second-hand motor cars, automobile accessories, gas, oil and tires. The capital stock is divided into 100 shares with no par value. J. S. Brake is president of the new concern. Associated with him is L. P. Hunt, vice-president, and I. Noble, secretary and treasurer.

Greensboro, N. C., Oct. 6.—The Miniature Motor Company, dealer for the new Austin automobile, has opened show rooms at Coxe Avenue and Aston Street. George W. Bowles and R. C. Currence are the partners of the new concern.

St. Louis, Mo., Oct. 6 (UTPS).—The Herbert J. Browne Motor Company, 5151 Easton Ave., has been named associate De Soto dealer by the Mound City Motor Company, distributor. The concern will retail Plymouth cars. The new cars are to be sold at 3006 North Union Boulevard, while the Easton Avenue store will be used for the sale and display of used cars.

CONTINENTAL MOTORS
Power of a Nation
AMERICA'S STANDARD



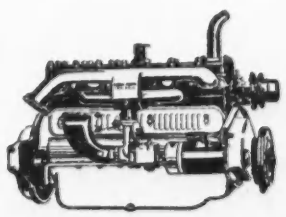
IDENTITY:

Continental's identity is concealed beneath the hood. Its value is evidenced in the superior performance of the many makes of fine motor cars powered by its product. Fine tools, fine workmen and fine standards—plus experience that has developed an almost sixth sense in engineering ability—have created in Continental a force that *must* be a vital element in today's economic picture.

CONTINENTAL MOTORS CORPORATION

Offices: Detroit, Michigan, U. S. A.
Factories: Detroit and Muskegon

The Largest Exclusive Motor Manufacturer in the World



Continental Motors

Motor Shares Still Weak; Accessories Sag

PRICE AVERAGES DROP SLIGHTLY

News of Industry Is Growing More Encouraging

AUTOMOTIVE DAILY NEWS STOCK PRICE AVERAGES

	Sept. 27	Oct. 4	Net Chge.
60 Automotives ..	25.76	24.03	—1.73
20 Passenger cars.	24.58	24.73	+ .15
20 Accessories	27.51	24.83	—2.68
10 Rubbers	30.00	29.26	— .74
10 Trucks	16.42	15.78	— .74
ACTIVE STOCKS			
General Motors....	40⅛	39⅞	— ⅛
Chrysler	21	21¼	+ ¼
Bendix	24	23	—1
Mack	51	51	...
Hudson	24½	25	+ ½
Goodyear	51	47	—3
Electric Auto-Lite..	51⅜	49	—2⅜

By CONRAD ALEXANDER

NEW YORK, Oct. 6.—**Motor shares in the past week inclined to the weak side, with the accessory and equipment stocks displaying the least resistance to the bearish attacks and showing the least buoyancy on the upside during the rallies of the week.**

The omission of its regular quarterly dividend by the Hupp Motor Car Corporation caused no unsettlement of the motor shares, this move having been anticipated in advance. Estimates of earnings of leading motor companies issued during the week were favorable in view of the condition of business as a whole. The fact that most of the large manufacturers will show any profits at all in the final half of the year is significant and indicates that the industry is in a much better condition than during the last "down-cycle" in the business world, namely, the post-war deflation period.

It continues to be almost certain that General Motors will earn the $3 per share needed to pay the present dividend on the common stock, and that no reduction in this rate will be made. There will, of course, be several more cuts in dividend rates on the common stocks of motor companies, but these have already been discounted and should have little effect on the market valuation of the stocks of the companies making the reductions. This is evident when a study is made of the yield of several motor stocks at their present prices and dividends.

Some encouragement was found in the statement on Saturday by officials of the Ford Motor Company that automobile sales would pick up in the final quarter of the year and that business generally would show improvement.

The B. F. Goodrich Company reported that sales of tires in September were greater than in the corresponding month of last year and pointed out that this indicated a definite upswing in business.

The average price of sixty automotives in the past week declined 1.73 points from 25.76 to 24.03, a new low for the year. Passenger stocks were up slightly in average price, while the accessories continued to show weakness, with a decline of 2.68 to 24.83, also a new low for the year.

Sentiment in Wall Street regarding the motor stocks continues to be one of watchful waiting, with many "long-pull" commitments being recommended, however.

Reports from a number of automobile manufacturers indicate that a seasonal improvement in sales is well under way. Among the companies reporting increases this month are Chevrolet, Franklin, Ford, Graham-Paige, Jordan, Marmon, Nash, Pierce-Arrow, Olds and Stutz. Among the truck builders, White and Federal report retail sales increases.

DANBURY SHOW OPENS

Danbury, Conn., Oct. 6.—An automobile show opened in connection with the annual Danbury fair, held at the local fair grounds October 6 to 11. A number of Danbury dealers have entered the show.

MACK OPERATIONS SEEN AS SATISFACTORY

New York, Oct. 6.—The business of Mack Trucks, Inc., during the third quarter of the current year was adversely affected by the general depression in business. However, operations during the period were conducted at a profit, and although results will compare unfavorably with its excellent earnings record during periods of more normal industrial activity they are considered satisfactory, in view of the recent business slump.

Estimates place profits at around $600,000 during the third quarter, or about half the quarterly dividend requirements of $1.50 a share on the 763,320 shares of stock outstanding. Added to the profits of $1,900,633, or $2.49 a share, reported for the first six months, the indicated net for the first nine months is $2,500,000, or $3.25 a share.

These results are considerably short of dividend requirements of $4.50 a share for the nine months, but they are sufficient to indicate that the present rate of $6 a share can be maintained conservatively until 1931 business prospects and conditions become more tangible than they are at the present time. Taken in conjunction with results in the previous year they indicate the company's strong position even during periods of subnormal activity.

Maintenance of the $6 dividend is indicated both in the company's strong financial position and the fact that nine months' results added to those of 1929 will show Mack paying less in dividends for the two years than it has earned. And during this period, the company's business was under the influence of depression for nearly eighteen months.

Current estimates indicate a fair profit in the fourth quarter of this year, making an estimate of $4 a share for the company in 1930 seem conservative. On top of profits of $6,841,068 for the full 1929 year, which were equal to $9.05 a share on the stock, this would indicate profits better than $13 a share for the two years against dividend payments of $12 for the same period.

PACKARD MOTOR OF N. Y. HOLDS UNUSUAL SHOW

New York, Oct. 6.—The Packard Motor Car Company of New York, in conjunction with John Wanamaker, is holding a Color Show, this week, at its building at Broadway and 61st Street.

LIST OF EXHIBITORS AT HIGHWAY SHOW

Special from A. D. N. Washington Bureau

Washington, Oct. 6.—Following is a complete list of the exhibitors at the international exposition and demonstration of the American Road Builders' Association, which opens tomorrow in the Washington Auditorium:—

J. D. Adams Company, Indianapolis.

Allis-Chalmers Mfg. Company, Monarch tractors division, Springfield, Ill.

American Gas Accumulator Company, Elizabeth, N. J.

American Tar Products Company, Pittsburgh.

Armco Culvert Mfrs. Association, Middletown, O.

Arundel Corporation, Baltimore.

The Asphalt Institute, New York.

Austin Manufacturing Company, Chicago.

Automatic Signal Corporation, New Haven, Conn.

Barber Asphalt Company, Philadelphia.

The Barrett Company, New York.

Biehl Iron Works, Inc., Reading.

Black and Decker Mfg. Company, Towson, Md.

Blaw-Knox Company, Pittsburgh.

Bragg-Kliesrath Corporation, Long Island City.

Bucyrus-Erie Company, South Milwaukee, Wis.

Byers Machine Company, New York city.

Caterpillar Tractor Company, Harrisburg, Pa.

Central Iron & Steel Co., Harrisburg, Pa.

Clay Products Corporation, Chicago, Ill.

Clinton Motors Corporation, Reading, Pa.

Colas Flintkote, Ltd., London, England.

Colprovia Roads, Inc., New York city.

Conant Machine & Steel Co., West Concord, Mass.

Concrete Surfacing Machinery Company, Cincinnati, O.

Davey Compressor Company, Kent, O.

Dual Duty Sales, Washington, D. C.

Edwards Manufacturing Company, Cincinnati, O.

Euclid Crane & Hoist Co., Euclid, O.

Ford Motor Company, Washington, D. C.

Galion Iron Works and Manufac-

(Continued on Page 11)

FINAL REVISION, COMPLETE NEW PASSENGER

Figures in this table are from R. L. Polk & Co. of Detroit, with the exception of Illinois, which are supplied by the Robinson Advertising desiring county, city or town lists, or lists of owners in any given

Some of this data has been published previously, but it is

Returns for today: Colorado, Kansas, Mississ

Comparative figures for August,

States	Auburn	Austin	Buick	Cadillac	Chevrolet	Chrysler	Cord	DeSoto	Dodge	Durant	Essex	Ford	Franklin	Gardner	Graham	Hudson	Hupmobile	Jordan	La Salle	Lincoln
Alabama		1	78		607	11		8	5	3	19	781			5	4	9		1	1
Arizona	1	4	72	2	126	18		8	17	8	5	241			8	4	4		1	1
Arkansas		6	47	5	428	41		11	33	2	5	670	1		18	4	2		2	
California	65	118	1311	73	3148	389	15	296	321	252	163	6408	29	3	212	129	167		78	22
Colorado	5	20	195	2	534	38	1	14	53	25	30	579	1		28	19	14		7	2
Conn'ticut	20	26	360	33	569	137	3	89	95	17	150	999	14	2	43	62	60	3	19	3
Delaware	2	4	79	5	136	19		3	2	10	12	238	1		2	5	3		3	
Florida	7	17	99	2	474	39	3	16	20	3	26	841	4		41	24	9		4	1
Georgia	8	12	212	11	1363	75	1	25	74	11	19	2065	11		28	27	33		13	1
Idaho	2	2	56		247	15		15	23	24	8	375	1		9	3	5			
Illinois	34	47	979	58	2503	347	26	218	258	45	162	4433	39	12	114	89	125		53	35
Indiana	24	32	342	14	1163	114	9	85	84	16	110	1764	8		58	69	37	1	10	4
Iowa	15	31	260	6	1770	85		20	129	61	81	2092	4		40	61	24		8	1
Kansas	3	21	221	1	1226	56		36	80	13	76	1590	3	2	12	33	7			1
Kentucky	6	15	81	3	576	65		18	40	11	41	954	2		13	13	15	1	3	4
Louisiana	2	8	74	2	507	45		24	59	3	16	867	1	4	18	17	11		5	1
Maine	2	4	93	9	287	45	1	17	34	18	88	489	2		15	39	14	1	4	
Maryland	5	6	250	3	917	67	1	16	31	11	46	976	7		34	21	31		16	3
Mass'setts	27	45	814	49	1388	230	4	50	209	34	360	3079	25	5	77	163	119	8	47	6
Michigan	6	46	890	64	1313	126	3	34	71	34	118	3198	6		55	98	29	1	26	6
Minnesota	3	11	246	8	1175	118	1	28	60	26	70	1428			46	48	37		7	3
Miss.	1	8	90	1	547	41		16	11	2	13	622			12	7	4		1	2
Missouri	14	28	372	16	1996	114	3	45	123	44	67	3066	4	9	71	44	63	3	28	6
Montana	2	1	57	2	486	23	3	23	39	14	25	575	5		8	29	13		2	
Nebraska	2	12	127	3	1027	40		13	54	11	30	1335	2		17	15	10		1	
Nevada	2	4	27		79	22		10	6	3	5	147		1	6	7	5			
N. Hamp.	5	7	70	4	168	25	1	11	16	7	25	266	2	1	3	15	9	1	2	2
N. Jersey	54	62	920	54	1520	287	12	78	154	56	201	2838	16	1	88	128	109	10	38	17
N. Mexico	1		69		191	6		5	9	4	12	257			3	9			2	
New York	194	127	2676	141	3665	851	22	259	380	122	537	7674	145	6	262	310	251	32	92	63
N. Ca'lina	2	10	156	6	829	74		14	56	2	41	1383	1		10	31	7		5	4
N. Dakota		1	14		153	8		2	7	7	7	172			5	2				
Ohio	56	37	835	62	2322	242	10	168	179	69	283	4123	33	1	96	157	94	15	33	16
Okla.	7	10	293	6	1359	66	1	28	106	30	35	1752	12		18	27	14		5	3
Oregon		26	140	2	311	34		25	37	34	17	546	6	3	31	17	9		2	3
Penn.	59	101	1559	97	3184	690	8	291	427	124	369	5839	42	7	274	179	205	11	65	11
Rh. Island	6	7	118	4	257	57	1	32	39	2	32	426	3		18	21	10		7	3
S. Ca'lina		12	65		507	20		10	16	2	10	656			3	15	7		2	
S. Dakota		6	40		351	32		7	29	21	12	516	2		10	11	8		2	1
Tenn.	1	11	134	4	751	35	2	12	50	6	33	1215	4		14	11	11		10	4
Texas	6	46	645	12	2963	188	4	135	156	29	57	4145	8		57	23	38	2	20	7
Utah		2	30	1	99	8	1	5	10	20	8	156	2		8	5	3		2	
Vermont	1	3	64	3	150	24		8	27	4	44	276	2		12	12	10		4	
Virginia	3	18	113	1	1000	65		38	62	7	39	1161	2		37	23	38		5	1
Wash'gton	11	18	269	5	533	94	2	72	57	66	40	1105	7		20	30	53	1	3	1
W. Va.	5	6	80	4	533	59		29	66	13	40	787	3		35	15	10		3	1
Wisconsin	9	9	420	32	951	95	1	41	81	31	73	1348	1	2	50	47	25	2	14	2
Wyoming	1	2	28		105	11		4	12	5	4	119			3	5	2		1	
Dis. of Col.	10	7	146	7	313	40	2	20	21	9	42	904	3		22	16	19	1	5	2
Total	689	1057	16316	817	46807	5331	141	2432	3928	1371	3706	77476	464	59	2069	2143	1782	93	661	246

Combined Reports—Buick and Marquette; Marmon and Roosevelt; Black Hawk and Stutz.

The Effect of Time on Production Cost

(Continued from Page 4)

The lowest cost will be arrived at if 4.2 lots are used. For all practical purposes, however, this may be taken as four lots per year, one set-up every three months.

Let us now see what the cost is with such an arrangement.

$$\text{Cost (4 lots)} = \left\{4x150(S)\right\} + \frac{[30{,}000(N)\times 3(C)]\times 0.06(I)}{2x4\ \text{(setups)}} = \$1{,}275. \quad (14)$$

Comparing this result with what the cost would have been with one set-up, we see that there is a saving of $2,850—$1,275=$1,575, or 55 per cent.

A More General Formula Stated

In fact, the foregoing method is too simple for actual use because it concerns itself with only two factors, capital and set-up cost. A more general formula suitable for use is:

$$X=\left\{\frac{NCI(J+L-LJ)+S^*}{2S}\right\}^{\frac{1}{2}} \quad (15)$$

X=number of lots to be used during the year.

C=cost per piece of material (raw).

I=interest rate per year.

S=set-up cost for one set-up.

S*=cost of storing the finished product in dollars per piece per year.

J=ratio of output to capacity, the the output being N pieces per year.

L=ratio of cost of finished product to cost of raw material, the factor taking into account the value added by the work done to the piece.

These factors were chosen because they are the most prevalent in the average company. For any particular company a special formula can be worked out that omits some of the unimportant factors and includes others peculiar to that industry. For example, we may include such factors as spoilage due to storage, depreciation, the chance of obsolescence and the like. The formula in such a case would be similar to the one given, but would contain the special factors mentioned in some form or other under the radical sign. For any particular plant it would be best to work these out separately rather than to use a highly complicated formula which would contain all of the factors desired, but contains, also, irrelevant factors which would cause confusion.

Measuring Particular-Function Efficiency

There is another use of this type of analysis which should be discussed. The fact that one can, for any set of conditions, determine the lowest cost arrangement, brings up the possibility of measuring the effiency of the particular function. Taking a practical illustration, let us assume that a plant having the foregoing data is operating at two set-ups per year, having found from practical experience that two set-ups are better than one. The cost of doing this was $1,650, as shown by equation (5).

The cost involved with four set-ups, shown to be the most economical, was $1,275, as shown in equation (14), the difference in cost being $1,650—$1,275=$375; or, expressed in percentage over the lowest cost, 29.4 per cent. This shows that the particular function is operating at a cost of 29.4 per cent. too high. If only one set-up had been used, this would have been over 100 per cent.; that is, ($2,850—$1,275) / $1,275=124 per cent. above the lowest cost combination.

There may be some objection to basing efficiency, if this is to be computed, on the lowest cost factor, since it is quite possible that a negative efficiency will result, which is, of course, absurd. The procedure, however, does have two distinct advantages. First, the fact that the lowest cost obtainable is known avoids any illusions as to functional efficiency. Over any given period, costs can be reduced considerably; yet such a reduction may be insignificant as compared to the possible reduction. At any rate, it affords no measure of efficiency, the two costs being merely relative, without an actual basis. Knowing the lowest cost obtainable, however, gives one a measure of how much the particular cost reduction increases efficiency.

Second, since basic conditions vary from time to time, a variation in the cost of any one function cannot be a measure of how effectively or ineffectively the function is being handled. It may happen, for example, that one of the factors has been reduced to such an extent, because of changing business conditions, that even what appears to be a large saving is not an increase in efficiency. On the other hand, the cost of a factor may have increased; hence, total costs are higher for this period than for the preceding one. Whether they are higher in proportion or not, however, cannot be determined unless the lowest cost obtainable, for that set of factors, is known. To illustrate this more clearly, we will use a set of definite figures.

For the simple equation involving the two variables, let us assume as before, the following data, for 1930: that is, N equals 30,000 pieces, the production per year; C equals $3, the cost per piece; I equals 6 per cent. per year, interest rate, and S equals $150, the set-up cost. The plant was operating with two set-ups; hence, the cost as shown previously was $1,650. It was also shown that this was $375 more than the lowest cost arrangement. But let us now assume that business conditions have changed for the year 1931, and that we then have new values for the factors C and I, namely, $4 as the cost per piece and 9 per cent. as the interest rate, the fatcors N and S retaining the same values as for 1930. Assume also that the plant continues its operations on two set-ups. Then we have

$$\text{Cost (2 set-ups) equal:} \quad (16)$$

$$2\times 150(S)+\frac{\left\{[30{,}000(N)\times 4(C)\times 0.09(I)\right\}}{2(A)\times 2\ \text{(set-ups)}}$$

equals $3,000.

The increase of 1931 costs over 1930 costs would then be $3,000 — $1,650 = $1,350.

With the cost almost doubled, the question arises as to the justification of this increase. Technological efficiency has remained unchanged, wages are the same as in former years, output remained constant, and the set-up cost remained the same; so there is no visible proof, except that the material prices and the rate of interest increased. Unless the foregoing method is resorted to, there is no way of telling whether or not this increase in cost is justifiable and whether it is in proportion to the increase in the other factors or not. Let us measure this in terms of percentage. The new arrangement, according to the formula, should contain the following number of set-ups:

$$X=\left\{\frac{[30{,}000(N)\times 4(C)\times(I)]}{2\times 150(S)}\right\}^{\frac{1}{2}} \quad (17)$$

Cost (6 lots) equals:

$$6\times 150(S)+\left\{\frac{[300{,}000(N)\times 4(C)\times 0.09(I)}{2\times 6\ \text{(set ups)}}\right\} \quad (18)$$

equals$1,800.

The most efficient arrangement under the new set of conditions would involve a set-up every two months and a ccrresponding total cost of $1,800. The net loss, due to the arrangement for the two set-ups actually used, is $3,000—$1,800 =$1,200. This compares with $375 in 1930. If expressed as an arbitrary efficiency, the two figures compare as (1250/1650)=76 per cent. for 1930 and (1800/3000)=60 per cent. for 1931.

A similar combination could be worked out for other factors, increasing or decreasing any or all of them. The actual "lowest cost" will change, no doubt; but it will nevertheless remain the lowest cost obtainable under that set of conditions, that is, under conditions as they are.

This type of analysis can be used whenever capacity is greater than production, especially if the equipment can be used for other purposes than the one in question. It can be used to a very great advantage in purchasing when the time factor must balance with discounts, or lower costs due to large quantities. It can be used in the shops in connection with the main product, drop forgings, castings, heat-treatment, and in all operations that are not continuous which involve a set-up. Even larger savings may be achieved by the application of this method to the relatively insignificant items, to supplies, tools and small parts, and to items which are bought in quantities with an almost entire disregard as to capital tie-up, because the amounts involved are **relatively** small. The formula will be different, but the method will be the same; that is, to balance forces working in opposite directions.

CAR REGISTRATION STATISTICS, AUGUST, 1930

Service, Springfield, Ill., and New Jersey, which are furnished by the New Jersey Motor List Co., New Car Division, Trenton, N. J. Readers section, may obtain these by addressing any of these three companies

given here complete for the convenience of our subscribers

ippi, New York, Tennessee Texas and Wyoming

1929, will be found on Pages 10-11

States	Marmon	Nash	Oakland	Oldsmobile	Packard	Peerless	Pierce-Arrow	Plymouth	Pontiac	Reo	Studebaker	Stutz	Viking	Whippet	Willys	Willys-Knight	Windsor	Miscellaneous	Totals
Alabama	2	2		1	9			20	2	1	13			3	5	1			1,592
Arizona	2	16	8	8	5			15	11		43	1		3	6	3			641
Arkansas		12	6	11			4	64	18		5	1		6	2	1			1,405
California	64	320	131	135	226	14	43	234	236	66	763	2	16	30	67	90	30	10	15,676
Colorado	7	55	13	20	11	2	4	63	44	11	49	2	3	16	31	7			1,905
Conn'ticut	25	106	54	57	74	3	12	93	147	37	126	1	2	14	19	23		1	3,498
Delaware	2	8	9	1	14			19	24		11		2	1	4	1			620
Florida	6	19	13	19	11		2	49	25	7	14		1	9	9	7			1,821
Georgia	7	24	13	41	16		6	74	62	9	71		7	11	25	9			4,364
Idaho	1	16	7	13	3			43	20	2	15		1	9	7	3			925
Illinois	37	257	104	214	245	12	29	383	323	28	555	17	12	62	151	85	10	12	12,113
Indiana	41	71	42	97	43	4	6	234	124	18	184	1	4	51	61	13		4	4,942
Iowa	22	84	29	78	19		1	247	144	14	90	1	3	57	95	18		12	5,602
Kansas	8	52	27	39	5	2	3	121	110	17	67	4	2	23	38	14			3,913
Kentucky	8	9	14	10	11	1		112	57	8	73	1		13	24	15			2,217
Louisiana	8	63	13	13	9		3	48	48	1	35			2	5	6	1		1,919
Maine	5	43	19	25	9	3	2	80	70	4	51			8	17	8			1,506
Maryland	11	43	32	36	18	3	3	89	91	7	70		1	16	21	8	7		2,897
Mass'setts	43	277	53	112	137	16	36	205	265	54	271	3	13	21	60	74		2	8,383
Michigan	29	78	50	113	74	5	4	236	167	99	143		20	30	43	11		4	7,230
Minnesota	6	65	27	67	53	2	11	235	113	9	123		1	56	74	41		1	4,199
Miss.	5	13	1	6	5		2	29	14	5	31			2	4	5			1,500
Missouri	23	130	58	98	39	2	11	212	153	22	105	4	6	47	84	27	7	1	7,145
Montana	4	24	15	10	2		8	42	36	9	28			12	32	10		1	1,540
Nebraska	3	30	7	38	11		1	141	51	8	68		2	32	48	12			3,151
Nevada	2	3		4				13	4		14		1	1	2	1			369
N. Hamp.	4	24	3	22	4	1	1	21	22	13	21			3	12	8			799
N. Jersey	52	278	117	186	142	16	37	175	211	48	321	4	9	23	68	85	1	2	8,418
N. Mexico	1	3	2	2	5			10	5	2	3			5	5	1			612
New York	114	628	276	507	405	35	115	683	581	163	868	16	33	111	266	218	4	17	22,849
N. Ca'lina	4	16	13	17	8		1	74	65		23		1	9	14	3	1	1	2,881
N. Dakota	3	4	3	9	1			21	10		7			6	6	4			452
Ohio	58	253	135	217	138	36	20	498	336	60	357	2	13	131	216	116	1		11,418
Okla.	7	35	31	25	28		10	116	93	9	44		2	30	43	7	1		4,253
Oregon	4	37	12	17	12		3	39	38	13	65		1	11	6	13			1,514
Penn.	81	363	186	330	239	28	44	984	435	87	531		10	81	270	125	9	15	17,360
Rh. Island	3	26	19	43	12	8	4	44	75	14	47		4	6	18	17		2	1,385
S. Ca'lina	1	10	3	3	5			39	18	3	6			2	2				1,417
S. Dakota	4	20	12	53	2		2	58	23	4	27		3	13	19	4			1,297
Tenn.	4	19	10	30	13		4	72	36	8	83		1	30	18	13	4	1	2,656
Texas	18	83	39	52	39	1	15	282	170	49	185	1	8	31	56	22	1	1	9,594
Utah	2	17	2	6	7			6	8	3	10	2	3	3	1				430
Vermont	2	28	10	6	5	1	1	45	18	2	15		2	16	12	8			815
Virginia	5	28	20	30	12	7	5	87	93	9	30		1	24	27	14	1		3,006
Wash'gton	5	37	28	41	20	4		144	83	13	102		3	19	30	26		1	2,943
W. Va.	13	34	24	27	11	2	2	114	62	7	39		4	16	28	16		1	2,089
Wisconsin	19	145	44	80	35	5	8	176	139	10	179	1	7	24	72	19		2	4,199
Wyoming	1	7	4	8	3			17	4	2	10			2	3	1			364
Dis. of Col.	5	24	24	37	25	15	1	30	53	7	59		4	2	10	7		21	1,913
Total	781	3939	1762	3014	2220	228	464	6836	4944	962	6050	64	206	1133	2136	1220	78	112	203,737

DURANT RENAMES OLIVER DALLAS DISTRICT MANAGER

Dallas, Tex., Oct. 6.—After an absence of six months from the organization, J. S. Oliver has been reappointed district manager for Durant in the Dallas territory, with headquarters at 1709 Commerce St. Prior to his reappointment Oliver held a similar position with Marmon here.

Winding up of the affairs of the Dallas Durant Company, 711 North Harwood St., has been placed in the hands of Ward Lederer of New York, special representative of W. C. Durant, who, himself, was a district manager for many years.

CLASSIFIED ADVERTISEMENTS IN THE AUTOMOTIVE DAILY NEWS BRING RESULTS

Latest Developments in Machining Aluminum And Its Alloys

By R. L. TEMPLIN

Aluminum Company of America

The following is an extract of a paper to be presented before the production meeting of the S. A. E. in Detroit, today.

The many improvements that are constantly being made both in machine tools and in the alloys of aluminum, present new problems whose solutions bring out many facts heretofore unemphasized or unrecognized. Introduction of new materials such as cemented-tungsten-carbide for cutting tools has stimulated research work in machining aluminum, as in the case of other metals, with results which modify previously determined machining practice.

Experimental work and production experience seems to indicate that a cutting tool should have a top rake of about forty-five degrees, a side rake of about fifteen degrees, a front and back clearance of about seven degrees, making the total included angle of the cutting edge approximately thirty-eight degrees. (See Fig. 1.) The edges of the tool must be keen, smooth and free from wire-edges or burrs.

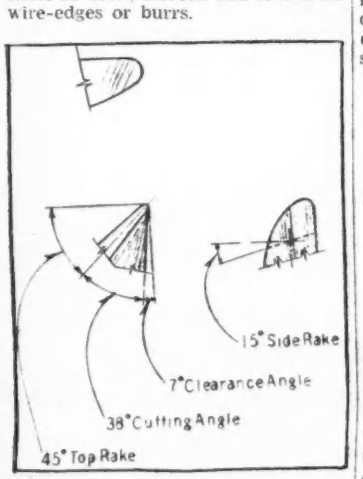


Fig. 1. Cutting Tool Angles

When used under proper conditions, a tool meeting these requirements will produce: (1) a clean cut, smooth surface on the work; (2) a minimum amount of disturbance both to the surface of the work and to the metal being removed; (3) a minimum amount of frictional heat, and (4) little, if any, deposition of metal on the top of the cutting edges of the tool.

There are many factors which must be given proper consideration simultaneously with tool shape for best results. The more important of these factors include: (1) type of tool, (2) tool material, (3) rate of cutting or amount of stock removed per unit of time, (4) coolant, (5) character of the work, (6) machine tool used, (7) the operator's personal equation, and (8) availability of commercial tools and machines of desired kind.

It is sometimes found that circular forming tools with marked differences in the diameters of their contours make it quite impracticable to use the desired cutting-edge angles. Again, the cutting edges of the tool may be of the desired shape, but the design of the tool may not have ample provision for taking care of the continuous and but slightly curled cuttings that are characteristic of many of the alloys of aluminum.

The choice of tool material will be governed to some extent by the type of tool, the machine with which the work is to be done and the character of the work. High-carbon steel tools ground to the thin cutting edges desired for aluminum may give an early failure because of brittleness. High-speed steel tools give much better results when machining alloys of aluminum except those containing appreciable amounts of silicon. These high-silicon alloys, however, can be readily machined on a production basis using the cemented-tungsten-carbide tools.

The rate of cutting is a function of speed, feed and depth of cut. Each of these may be and usually is closely related not only to each other but also to any or all of the other factors under consideration.

The coolant used in cutting metals serves to carry off the heat generated during the machining operations and probably acts as a lubricant between the chip and tool as well as between the work and the tool. The comparatively high thermal conductivity of aluminum materially assists the coolant in performing the first of these functions, while the nature of the coolant is of more importance in the other. Experience to date has indicated that a mixture of lard oil and coal oil or kerosene, usually of equal parts, generally will give satisfactory results when used as a coolant. It must be pointed out, however, that satisfactory results are frequently obtained using solutions of soluble oil and water.

The character of the work will affect the results obtained, depending on whether or not the part must have a high degree of finish accurate or approximate dimensions, requires this or that type of tool, indicating machining with lathe, shaper, milling machine, drill press or other machine tool. This fact may be obvious to many, but experience has shown that some of these items are very frequently ignored in selecting speeds and feeds for a given job.

Machine tools sometimes used in machining aluminum are of such design or in such mechanical condition as to preclude the obtaining of satisfactory results. Worn spindle bearings, lost motion, too much spring in tool posts, arbors or holders, permitting chatter or "hogging in" of the cutting tools are direct preventives of satisfactory results. Until somewhat recently many of the machine tools available were not designed to give the high cutting speeds recommended in machining aluminum.

The introduction of the cemented-tungsten-carbide tools has shown the need for higher cutting rates. Accordingly we find much higher spindle speeds, feeds, better bearings and other features that go with the increased cutting speeds, incorporated in some of the newer machine tools. In general these features are all favorable towards the better machining of aluminum.

A machine-tool operator whose experience has been confined largely to the machining of brass and steel is frequently quite reticent about using tools having the extreme shape recommended for aluminum. It is necessary that the operator not only understand what the proper tool shapes are, but that he use them when machining aluminum.

Recently there have appeared on the market circular saws with cemented-tungsten-carbide tipped teeth. Under proper operating conditions, such saws will cut aluminum much better than the customary type of circular saw. The proper operating conditions call for high speeds (up to 12,000 linear feet per minute or possibly more), comparatively light but positive mechanical feeds, secure clamping of the work and some coolant such as soluble oil in water. Such saws cannot be used successfully in hand or gravity-feed type of sawing machines or under conditions where the work is not held firmly clamped in place. A positive feed must be used so that the hook-shaped tooth will not "hog" into the work and thus break off the tips of the teeth. High-speed steel teeth of similar shape and design will give satisfactory results in sawing many of the alloys of aluminum but the high-silicon alloys require the use of the cemented-tungsten-carbide teeth for best results.

The helical type of milling cutters, reamers, and end mills having considerable top rake on their cutting edges continue to give good results in machining aluminum. Likewise in the case of the spirally fluted taps, but in nearly all such tools the cutting edges could be made thinner to advantage. This usually can be done by grinding an increased amount of top rake on the cutting edges.

Fundamentals of Machine Polishing

By ROBERT T. KENT

This is the concluding installment in part of a paper presented before the National Metal Congress by Mr. Kent, director of engineering, Divine Brothers, Utica, N. Y.

In some classes of work it may be desirable to divide the cushion required for flexible grinding between the wheel and the work. The wheel is made of the proper density and cushion to give the desired finish, and a cushion surface is provided under the work to enable it to give sufficiently to take care of slight variations in contour that would cause the wheel to cut deeper were the work not able to recede somewhat from the wheel. The cushion can be provided by means of a resilient material, such as a canvas or leather belt, or springs. The greater the cushion the less accurate will be the surface so far as dimensional properties are concerned. On highly accurate work, where the dimensions must be held within close limits, or corners and edges held up sharply, little or no cushion should be provided under the work.

Vibration in a polishing machine produces the same evil effects that it does in any other kind of ma-

(Continued from Page 11)

COMPLETE NEW PASSENGER CAR

These figures are repeated for comparative purposes

States	Auburn	Austin	Buick	Cadillac	Chevrolet	Chrysler	Cord	DeSoto	Dodge	Durant	Essex	Ford	Franklin	Gardner	Graham	Hudson	Hupmobile	Jordan	La Salle	Lincoln
Ala., '29			159	2	1175	40		2	31	6	21	1503	1		21	6	8		2	2
Ariz., '29	12		86	1	408	25		26	27	40	27	495	3		44	15	9		5	1
Ark., '29	2		101	3	992	61		44	89	28	55	1515	3		26	17	12		9	1
Cal., 1929	87		2101	90	4150	738		502	661	637	687	8618	85	29	536	459	274	15	82	51
Col., '29	15		262	8	661	75		51	72	43	116	1556	5	1	50	51	33	2	9	4
Conn., '29	48		534	25	696	201		144	189	37	219	1274	30	3	130	94	83	4	43	12
Dela., '29	8		105	5	134	4		3	7	22	23	306	3		2	17	6		3	1
Fla., '29	7		169	12	804	63		22	65	5	78	1491	18		61	51	28	3	11	1
Ga., '29	3		193	3	1060	31		30	63	3	55	1969	5	1	46	23	20		7	2
Idaho, '29	9		100	1	446	24		39	67	91	71	743	1		25	22	12		1	4
Illinois, '29	170		1885	94	4091	541		382	570	178	876	8071	46	16	444	381	252	10	142	57
Ind., '29	65		614	10	2469	185		302	261	51	527	3996	9	1	167	167	82		22	7
Iowa, '29	27		536	3	3100	137		91	273	185	346	4840	4		145	103	68	1	15	7
Kansas, '29	9		431	3	2470	96		121	229	104	282	3942	8	1	95	148	38		9	3
Ky., '29	21		170	4	1202	93		67	131	52	204	1910	9	2	51	40	32	5	6	3
Louis'a, '29	8		131	7	1103	86		43	120	5	64	2003	3	6	64	30	35		10	5
Me., '29	4		202	4	405	64		24	54	21	157	626	11	2	25	63	10	1	16	6
Md., '29	11		398	10	1086	114		45	108	58	182	1812	15		76	63	75	3	11	5
Mass., '29	66		1142	54	1692	425		146	401	68	818	3627	66	15	220	315	213	34	83	21
Mich., '29	38		2133	34	3056	421		315	265	149	990	7593	10	9	391	387	322		59	25
Minn., '29	36		453	4	1539	184		72	132	114	271	3717	4	2	131	85	85		20	15
Miss., '29			93	1	865	50		31	38	6	10	1457			15	4	14		1	1
Mo., '29	29		602	32	3091	145		112	272	128	371	6017	31	16	166	113	130	2	42	9
Mont., '29	13		128	1	545	51		33	110	52	83	886	18		57	37	27		3	
Neb., '29	5		392	1	1837	66		64	168	81	103	3001			53	36	36		5	5
Nev., 1929	4		51	1	116	27		19	32	20	28	162	2		11	22			3	2
N. H., '29	7		90	4	222	37		25	37	26	54	358	7		17	19	12	2	4	
N. J., '29	140		1179	44	1740	428		182	242	90	499	3447	41	17	232	246	228	13	49	17
N. M., '29	2		60		334	16		16	27	17	24	359			7	7	1		1	
N. Y., '29	445		3414	169	4495	1090		546	726	218	1268	9120	217	9	712	600	631	44	148	117
N. C., '29			256	3	1091	99		48	101	20	113	2313	4		33	54	8		9	4
N. D., '29	2		46		264	20		10	17	18	27	586			11	11	2		2	2
Ohio, '29	148		1610	24	4215	540		458	410	198	1147	8516	57	6	439	373	294	29	40	25
Okla., '29	36		569	10	2615	135		69	344	38	127	3880	8		84	62	43		14	4
Ore., '29	8		186	3	641	67		36	78	163	88	1360	8	1	50	40	24		7	3
Penn., '29	186		2306	71	4226	950		529	670	337	1220	9258	117	12	545	474	405	43	124	29
Rh. Is., '29	22		189	18	304	87		80	78	18	110	429	16	2	50	35	35		25	9
S. C., '29			129	1	967	40		31	22	8	45	1653	5		7	40	13		5	
S. D., '29	6		82		595	29		14	68	47	68	920	1		27	23	27		2	
Tenn., '29	14		257	4	1553	91		48	121	28	107	2475	5	1	41	18	36		20	3
Texas, '29	20		1127	13	5771	316		385	481	147	282	8130	26	3	195	106	128	15	31	12
Utah, '29	6		94	2	271	25		19	24	61	48	536	3		32	15	13		5	1
Vt., '29	1		135	1	271	66		24	44	20	98	457	5		37	29	22		4	1
Va., '29	13		263	7	1539	89		65	119	43	198	2559	8		50	51	35	1	12	3
Wash., '29	38		320	2	891	193		106	102	237	167	2033	30		100	73	57	2	12	10
W. Va., '29	7		192	6	889	85		56	121	33	140	1393	4		91	45	30	1	11	4
Wis., '29	9		674	6	1506	143		101	180	86	338	2824	15		137	178	78		8	14
Wy., '29			47		149	22		9	38	9	26	305	2		8	8	13		1	1
D. of C., '29	13		228	12	399	60		18	15	7	90	919	8		75	26	43	2	24	4
Total, '29	1820	*	26624	813	74196	8575	*	5610	8500	4053	12948	136960	977	155	6042	5282	4082	232	1177	513

*Not on the market at that time.

Fundamentals of Machine Polishing

(Continued from Page 10)

chine, except that these effects are magnified. Vibration causes the polishing wheel to put chatter marks in the work. Due to the high speed of the polishing wheel, vibration is more easily set up than in machinery operated at lower speeds, and consequently must be guarded against more carefully.

The more common causes of vibration are: Inadequate machine foundations, improperly or lightly constructed buildings, light floors, machines improperly located on upper floors, insufficient weight in machine bases, shafts too light, or with bearings too far apart, giving them a tendency to whip at high speeds; insufficient bearing surfaces; improperly braced machine members, or members whose vibration period corresponds to some recurrent motion in some moving part of the machine; and unbalanced polishing wheels. One of the mistakes made in the design of earlier polishing machines was the provision of light frames. Some were made of structural sectons riveted or bolted together. Most of these machines have failed in one respect or another. The present-day polishing machine is a rugged structure, with heavy box-type frames, ball or roller bearings in the moving parts, massive spindles and automatic lubrication.

Vibration can also be caused by the work being improperly seated in the fixtures. A good machine should be sufficiently heavy to absorb such local vibration, although its effect on the polishing operation may be just as serious as vibration in the machine itself.

Too much cushion also may tend to set up vibration in the polishing wheel. An extreme example of this is the polishing of automobile bumpers. The springiness of the bumpers themselves furnishes a particularly resilient cushion, and at times the vibration period of the bumpers is such as to amplify the movement and actually cause the wheels to bounce off the bumpers as they pass over them. In this case, the cushion is lessened by providing supports at two or three points under the bumper, and attaching dash pots to each wheel spindle to damp the vibration.

The function of fixtures is to hold the work firmly, to present it in the correct position to the polishing wheels, and to provide a certain amount of resiliency and automatic adjustment of the work to the wheel. Fixtures must have certain characteristics embodied in their design and construction. They must hold the work so that it cannot be dislodged when it comes in contact with the wheels.

Another important point is ease of loading and unloading the fixture. A polishing machine that is capable of passing sixty pieces of work per minute under the wheels is badly handicapped if the fixture requires two or three seconds for loading. In many cases the fixture is attached to the machine, and must be loaded and unloaded "on the run." It therefore must be easy to load and unload, and free from complicated locking devices. In other cases, the fixtures is detachable, is loaded at the bench, and transferred loaded to the machine. Such fixtures should be light, yet rigid. All fixtures should have provision for compensation for wear, and in those cases where the fixture masks a portion of the work, the masking part must be capable of easy replacement. The fixtures should be made so that they can be placed on the machine in one position only. Otherwise, the work may be ruined or thrown from the machine, or the fixture itself may be thrown.

Where the shape of the work precludes the use of mechanical fixtures, substitutes may sometime be employed. For very flat work such as ornamental plates or spherical or similarly shaped work that is to be polished on the inside, and which is impossible of gripping in any type of mechanical chuck, a vacuum chuck frequently will prove to be feasible. For articles made of steel or iron the magnetic chuck is sometimes employed, although for polishing operations it possesses certain disadvantages. For flat strips or sheets, pressure rolls on either side of the polishing wheel frequently may be substituted for fixtures.

The success or failure of many machine-polishing jobs more often than not depends on the ability to design a fixture that will properly hold the work. There is a wide field for ingenuity and real engineering in this one phase of polishing alone.

PRODUCTION MEETING OF S. A. E. ON TODAY

(Continued from Page 1)

in charge are: J. Geschelin, E. P. Blanchard, A. R. Fors, Erik Oberg, V. P. Rumely, F. W. Stein and C. C. Stevens from the S. A. E., and P. J. Kent, O. T. Kreusser, D. E. Anderson, Beulah Brede and F. W. Marschner from the Detroit S. A. E.

Sponsors of the production meeting are: C. E. Wilson, General Motors Corporation; A. K. Brumbaugh, White Motor Company; J. W. Brussel, Timken-Detroit Axle Company; E. F. Roberts, Packard Motor Car Company; V. P. Rumely, Hudson Motor Car Company; H. S. Vance, Studebaker Corporation; Ralph Murphy, H. H. Franklin Manufacturing Company; W. R. Wilson, Reo Motor Car Company; Bert H. Warner, Pierce-Arrow Motor Car Company; A. U. Widman, Cadillac Motor Car Company; Joseph B. Graham, Graham-Paige Motor Company; K. T. Keller, Chrysler Corporation; J. A. Callahan, Briggs Manufacturing Company; George W. Smith, Jr., White Company; E. P. Blanchard, Bullard Company; J. B. Armitage, Kearney & Trecker Corporation; R. E. Flanders, Jones & Lamson Machinery Company; R. G. Mumma, Landis Machine Company; C. J. Stilwell, Warner & Swazey Company; H. H. Biggert, J. I. Case Company, Inc.; Du Bois Young, Hupp Motor Car Company; J. A. Sheldon, Willys - Overland Company.

LIST OF EXHIBITORS AT HIGHWAY SHOW

(Continued from Page 8)

turing Company, Galion, O.

W. S. Godwin Co., Inc., Baltimore, Md.

Good Roads Machinery Co., Chester County, Pa.

W. & L. E. Gurley, Troy, N. Y.

Hamilton Manufacturing Company, Two Rivers, Wis.

Harnischfeger Sales Corporation, Milwaukee, Wis.

Hastings Pavement Company, New York city.

The Heil Company, Milwaukee, Wis.

Heltzell Steel Form and Iron Company, Warren, O.

Hercules Motors Corporation, Canton, O.

Highway Service, Inc., New Bedgord, Mass.

Charles Hvass & Co., Inc., New York, N. Y.

International Bitumen Emulsions Corporation, Baltimore, Md.

Irving Iron Works Company, Long Island City, N. Y.

Keuffel & Esser Company, Hoboken, N. J.

Kinney Manufacturing Company, Boston, Mass.

Kohler Company, Kohler, Wis.

The Lakewood Engineering Company, Cleveland, O.

McEverlast, Inc., Los Angeles Cal.

Metalweld, Inc., Philadelphia, Pa.

Alexander Milburn Company, Baltimore, Md.

Motors Improvements, Inc., Newark, N. J.

National Equipment Corporation, New York, N. Y.

National Paving Brick Manufacturers Association, Washington, D. C.

Norma-Hoffman Bearings Corporation, Stamford, Conn.

Northwest Engineering Company, Chicago, Ill.

Tinius Olsen Testing Machine Company, Philedlphia, Pa.

Pan American Petroleum and Transport Company, New York, N. Y.

Portland Cement Association, Chicago, Ill.

Ransome Concrete Machinery Company, Dunellen, N. J.

Reo Motor Car Company, Lansing, Mich.

W. A. Riddell Company, Bucyrus, O.

Roads and Streets, Chicago, Ill.

Sawyer-Massey, Ltd., Hamilton, Canada.

Shell Petroleum Corporation, St. Louis, Mo.

Southwark Foundry and Machine Company, Philadelphia, Pa.

Standard Oil Company of New Jersey, New York, N. Y.

Standard Oil Company of New York, New York, N. Y.

Stroud Road Machinery Company, Omaha, Neb.

The Texas Company, New York, N. Y.

Truscon Steel Company, New York, N. Y.

United States Bureau of Public Roads.

United States Steel Products Company, New York, N. Y.

Walter Motor Truck Company, Inc., Long Island City, N. Y.

Warren Bros., Boston, Mass.

Waukesha Motor Company Waukesha, Wis.

Wej-Lock Manufacturing Company, Winterset, Ia.

Welsbach Traffic Signal Company, Philadelphia, Pa.

The White Company, Cleveland, O.

LIQUOR PILOT CAR NOT SUBJECT TO CONFISCATION

Asheville, N. C., Oct. 6.—An automobile used as a pilot car for a convoy of automobiles loaded with contraband whisky is not subject to confiscation under the old revenue act, according to an opinion handed down by the United States Circuit Court of Appeals on an appeal from the District Court at Asheville.

REGISTRATION STATISTICS, AUGUST, 1929

only. August, 1930, statistics appear on Pages 8 and 9.

States	Marmon	Nash	Oakland	Oldsmobile	Packard	Peerless	Pierce-Arrow	Plymouth	Pontiac	Reo	Studebaker	Stutz	Viking	Whippet	Willys	Willys-Knight	Windsor	Miscellaneous	Totals
Ala., '29	2	16	6	7	9			31	20		28			32		4			3,134
Ariz., '29	29	49	14	48	11		3	45	48	1	71	3	3	43		14		1	1,607
Ark., '29	8	46	7	18	2		4	93	82	6	31			97		10			3,362
Cal., 1929	155	661	146	467	520	42	57	242	766	141	942	23	52	234		372	15	189	24,826
Col., '29	27	106	15	67	27	3	6	83	108	4	56	5	3	139		34	1	1	3,699
Conn., '29	54	186	51	119	199	21	27	101	217	36	201	4	8	114		65	2	9	5,180
Dela., '29	2	30	14	14	26	1	1	19	32		20		1	19		4			832
Fla., '29	8	54	14	43	23		7	58	78	8	25	2	2	78		9		2	3,300
Ga., '29	4	31	8	31	14		3	53	63	9	41		1	99		10		3	3,884
Idaho, '29	6	46	13	34	6			60	68	7	42		1	64		10			2,013
Illinois, '29	172	812	218	717	461	89	50	570	1165	90	788	31	55	771		186	7	318	24,706
Ind., '29	159	198	57	362	72	23	9	232	579	30	387	23	22	391		88	4	24	11,595
Iowa, '29	67	200	51	261	52	14	1	287	461	16	176	4	14	568		53	1	6	12,113
Kansas, '29	32	152	52	193	15	5	7	244	496	24	122	2	5	438		45		2	9,823
Ky., '29	26	50	10	82	31	7	8	132	131	23	78	2	5	178		18		4	4,787
Louis'a, '29	16	122	20	41	37	7	8	85	189	3	48	1	3	56		19		1	4,389
Me., '29	28	69	19	64	33	10	3	63	107	18	67	1	5	76		19		2	2,279
Md., '29	26	116	25	105	83	5	14	84	213	16	91	4	5	123		32		1	5,015
Mass., '29	124	442	92	234	508	41	69	202	551	93	359	12	11	252		238		28	12,672
Mich., '29	107	173	100	559	334	4	22	392	703	101	292	4	35	413		96	1	12	19,545
Minn., '29	27	149	52	182	87	9	13	283	430	19	201	3	7	310		75	3	11	8,725
Miss., '29	3	54	5	11	9			47	50	7	4			53		8			2,837
Mo., '29	75	199	67	287	81	27	37	245	455	40	156	7	14	578		79	21	8	13,684
Mont., '29	24	97	20	38	6	1	3	119	99	11	68		6	109		27		2	2,674
Neb., '29	20	104	27	133	12	6	5	187	262	5	141	1	4	304		43		2	7,159
Nev., 1929	1	14	3	24	7	1		19	16	1	15		3	17		5		2	628
N. H., '29	17	43	9	33	29		2	28	42	3	19		1	39		21		1	1,208
N. J., '29	86	450	107	360	419	49	59	224	396	53	484	20	34	222		174	7	24	12,002
N. M., '29	5	16	3	13	1			35	23	2	19		5	55		9			1,057
N. Y., '29	277	1276	249	968	1207	106	175	592	1196	164	1147	65	81	860		500	29	86	32,947
N. C., '29	21	31	32	72	22		1	74	144	5	30		7	100		10			4,705
N. D., '29	13	24	10	27	4		1	37	35	1	16	2	2	86		17			1,293
Ohio, '29	172	501	191	794	352	166	51	502	1121	77	597	31	47	906		327	5	43	24,412
Okla., '29	24	135	73	102	77	5	15	173	401	44	135	4	8	332		26	1	2	9,595
Ore., '29	22	71	26	58	17		7	83	114	12	98		3	53		33		1	3,361
Penn., '29	232	809	195	797	579	71	100	718	1055	106	755	39	42	835		378	13	50	28,276
Rh. Is., '29	13	71	11	54	52	11	9	48	114	24	65		4	51		44		32	2,110
S. C., '29	9	23	11	27	19		1	47	72	2	16		4	50		1			3,248
S. D., '29	10	34	11	96	4			95	84	1	39	1	5	125		15	2	2	2,433
Tenn., '29	16	76	14	67	41		6	98	118	8	130		1	168		13	1	1	5,580
Texas, '29	74	259	84	251	115	12	27	412	664	91	323		15	549		100	4	4	20,172
Utah, '29	6	29	3	42	11			17	30	2	36	2	2	24		5			1,364
Vt., '29	8	86	12	36	24	5	4	62	54	11	36	3	4	71		22		3	1,657
Va., '29	32	57	42	73	47	5	7	134	216	7	73	2	8	219		23		5	6,005
Wash., '29	42	103	33	146	49	7	14	141	123	22	158	3	13	138		76		6	5,447
W. Va., '29	40	83	27	96	40	1	3	102	145	22	83	7	6	158		38			3,959
Wis., '29	50	286	62	221	64	10	25	243	404	16	239	4	15	293		57	5	20	8,311
Wy., '29	10	13	4	22	1			37	25	2	16	1	1	28	*	6			804
D. of C., '29	23	61	19	90	69	18	9	29	121	18	63	1	3	32		11	1	8	2,519
Total, '29	2404	8713	2335	8586	5908	782	873	7907	14086	1402	9027	317	576	10950	*	3469	123	916	376,933

Marmon domestic shipments for September were ahead of September 1929 and exceeded the combined totals of the previous two months by 19 per cent

WHAT THIS RECORD MEANS

Isn't it significant that in the face of a decline throughout the industry Marmon has not only equalled but even passed its pre-depression shipping totals? The swing to Marmon is definite and real. Retail sales are increasing. Dealers are making a profit. Back of it is a policy and program both for the present and the future which we welcome the opportunity of discussing with any interested distributor or dealer in open territory.

MARMON MOTOR CAR COMPANY, INDIANAPOLIS

MARMON